COMPUTERWORLD

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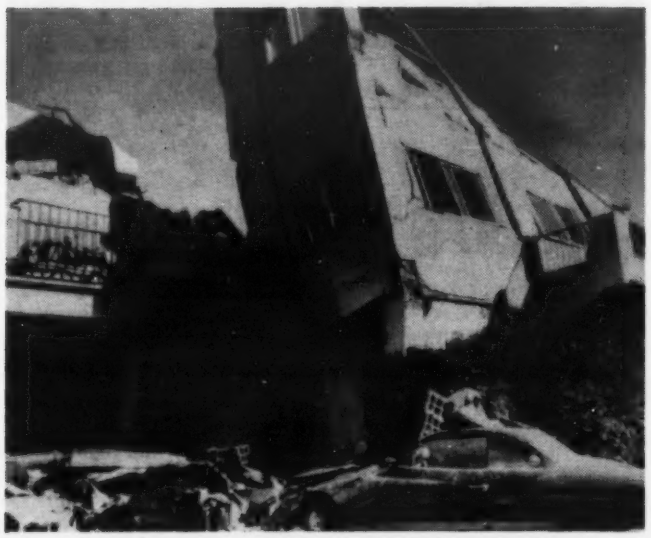
Most Systems Withstand Shock

Computers Show Resiliency After Earthquake



Part of the damage in the Sylmar section of Los Angeles reflects the severity of the southern California earthquake. (Wideworld Photo)

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – The early morning earthquake which rumbled through this city, leaving dead and injured people, widespread damage, fires, and power and telephone failure, saw half of the DP centers back in operation by noon and nearly all operational by the next morning.

"When I felt the earth roll and shake, I expected our computers to be a shambles. Instead the hardware resisted the shock unbelievably. The center was a mess but five hours later we were up and running."

This reaction of Bert De Visser, head of computing at Lockheed Aircraft Corp., which has plants near the hard-hit Los Angeles-San Fernando Valley, was typical.

"We had physical damage to the building including ceiling panels falling on equipment," he noted.

Disaster Drills

He explained that no data was lost due to power or equipment failure as the firm had been having disaster and sabotage drills for more than a year. It paid off.

As a result, when the first rumbles were felt, the equipment (an IBM 360/91, 360/75, twin 360/65s, two 360/30s, three 360/25s, an IBM 7080, two RCA Spectra 70/55s and an XDS 9300) was turned off . . . then the operators ran.

His biggest problem in resuming operations was getting the air conditioning working.

But a disaster of this scale was not without greater problems.

- In one center the operator was alone and, for security reasons, locked in. He could be let out only by the guard. When things started rolling, the guard fled, leaving the frightened operator locked in the room. He wasn't injured.
- An RCA field engineer was on the job at Disney Studios in Burbank when the quake hit. His supervisor said everyone in the computer room ran except the engineer. Doors on the equipment flew open and the units started swaying around. The engineer was almost pinned to the wall by the central processor as it started sliding.

He managed to get to the control side of the CPU and, hanging on to it to keep from being thrown to the floor, he went through the normal cycle-down routine to turn off the equipment.

This procedure saved the data and the system that would have been hit by the power failure that occurred soon afterwards.

- Jim Payton, vice-president of Xerox Data field engineering, cautioned all computer users that vibration may have caused hairline printed circuit board fractures and weakened solder joints that won't show up as failures until later.
- The roofs collapsed on a Honeywell H-120 installed at Deluxe Check Co., and an IBM 360/30 at Dyna Sciences Corp.'s Instruments System Division in Sylmar.
- Major damage to a dam necessitated evacuation of 80,000 people and some plants, including Litton Data Systems.
- IBM in L.A. received about 70 phone calls for service from customers between 7:30 and 8:15 Tuesday morning. These resulted, IBM said, from "the disruption of power following the quake or from the slight movement of equipment and loosening of cables during the tremor."

Customer engineers had all these installations operating by the end of the day, IBM said.

- RCA started the day with 15 systems down simultaneously and sent for field engineers from Northern California to back up its force.
- A 360/30 center in the San

(Continued on Page 2)

University Centers Struggling Amid Drain of Supporting Funds

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – University computing centers are approaching a crisis as supporting funds from the Federal Government, state governments and private institutions are being severely reduced or eliminated entirely. Centers are facing not just severe cutbacks in facilities and programs but the threat of losing their computers.

There is little optimism on the part of university people as they look at a bleak financial situation. Computers in this country were born and came to function in university centers, and they are now threatened with their very survival.

UCLA, with a 360/91 and a 4 Mbyte memory, one of the finest general academic computing facilities in the country, faces a $1 million to $1.5 million loss this year. The university is further threatened with expiration of an IBM grant in fiscal 1972 and a change in policy by the National Sciehce Foundation which would remove still more funds. The California Institute of Technology, operating a 360/75 with a total budget of $3 million, is also confronted with a $1.5 million loss.

Main support has been NSF funds, but this year they were cut one-third. In the same general Los Angeles area, the University of Southern California is more fortunate with three-fifths of its support coming from the university. NSF funds, which used to cover most of the balance, have been cut 50%. All three centers are agonizing with the dilemma of how to meet their budgets when money has disappeared, a growing occurrence throughout the country.

UCLA Problem

Dr. Leon Knopoff, head of the UCLA Senate Committee on Computing and a professor in the departments of geophysics, physics and music, elaborated on UCLA's problem.

"We are not only faced with a deficit, there is no seed money for new projects. One of our major supports has been an IBM institutional grant. There is a rumor these are to be eliminated in 1972. They have had a liberal policy in the past in giving grants with few strings. In addition, the NSF has been a prime supporter and we understand they are also giving up individual grants and are looking instead into supplying support for regional disciplines; all economists will work out of one centralized center, all geologists out of another, etc."

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On the Inside

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For Developing Nations

How About a DP Peace Corps?

CW West Coast Bureau

LOS ANGELES – A Peace Corps composed entirely of skilled DP personnel from this country could provide needed technology to underdeveloped countries to realize their computing needs.

This idea, said Dr. Gerald Estrin, professor of computer sciences at UCLA, would be welcomed abroad, and the needy countries "would love it." Estrin is chairman of the Jerusalem Conference on Information Technologies to be held Aug. 16-20.

Computers, Estrin stated, allow these countries to handle the data involved so that they can plan. In 1954, Estrin went to Israel to head up the team that built the country's first computer. "The computer meant tremendous things to Israel's advancement and it was vital for military logistics in defending their country. But it must be stressed that the main aid to a developing country is how a computer teaches people to plan. It affects every aspect of government and industry."

As a side benefit of this Peace Corps, Estrin mentioned that the surplus of computer people in the U.S. could be alleviated by going abroad and "doing something worthwhile with their lives."

The government should have had some plan like this under way "before displacing people," Estrin charged. In those countries absorbing the surplus "our people would have to work at the local pay level, not the U.S. level," he maintained.

Catching Up

Dedicated people throughout the world are seeking to "leapfrog" their countries to catch up with the 20th century, Estrin declared. One of the major goals of the second United Nations development decade is to meet the needs for computing facilities and trained manpower in developing countries.

Computer resources are very expensive and the hardware is only part of the cost, said Estrin, and a wrong start with a DP facility in a developing country can retard progress for years. To help avoid costly mistakes, the Jerusalem conference will focus on the developing nations.

There will be limited reading of formal papers and participants will go on field trips to see how Israel has used computers.

On the planning committee are seven vice-chairmen representing Africa, Asia, Australia, Europe, Latin America, Israel and North America.

Computer Systems Fare Better Than Expected in Quake

(Continued from Page 1)

Fernando Valley was put back on the air but was declared unsafe and everyone had to evacuate. In Burbank an XDS 9300 was located in a building which suffered structural damage and was cordoned off.

Can't Stop Running

The vital importance of computer centers was evident. DP centers in several buildings that were evacuated because of damage kept working in the deserted buildings.

At the Prudential Life Insurance Co. of America Building, where there was considerable structural damage, one of the employees said: "This building is right next to the L.A. Brea tar pits. Because of the kind of ground it's on it's built like a ship.

"When the earthquake came it just rolled from east to west."

When asked how it felt to be alone on the third floor with only the computer center people working, he said, "It's creepy."

The Prudential Center had its first generation IBM 705 and a 360/65 go down. The 360/30s and 40s were fine. The manager of the center said the 705 goes down "if you breathe on it" but nonetheless it was up and able to do some work that day.

John Coughlin, deputy director of Los Angeles County data processing, toured all county centers after the quake. He said there was superficial damage in two of the centers from broken glass, burst water pipes, and fallen plaster.

He had been afraid that disk crashes would occur caused by sudden evacuation of operators and loss of data from stretched tapes. There were no problems, however.

Ajis, the criminal booking and jail movement system, was down 38 minutes due to power failure and had to restore data missed during that period.

The two sites that were down the longest were non-critical systems. Power line failures and individual transformer problems were responsibile. The longest downtime was six hours.

The Metropolitan Water District for L.A. has miles of water pipes in its building but the only one that broke was directly over the IBM 360/30 CPU.

In addition to the water, the cork ceiling disintegrated, and debris permeated the unit.

The system went off at quake time and at 8 a.m. an IBM crew, including the district manager and four CEs, were on the site. William Kervahn, DP manager, said that IBM put fans under the unit and blew it out for 12 hours. In addition, it had lined up backup facilities in Portland, Ore., and Endicott, N.Y., if the unit couldn't get back on the air.

After the drying out and clean-up period the machine operated, and the installation was back at work at 10 a.m. the following day.

Communications with time-sharing and on-line systems were affected as the area overloaded the telephone company facilities. In some locations lines were down completely.

A particularly bad period was the afternoon and evening of the quake. But a survey of users of time-sharing and on-line terminals indicated some inconvenience but no major problems.

All critical systems such as the police inquiry system were up and running shortly after the quake.

The university computer centers survived very well and were back on the air when the power returned.

The Caltech supervisor felt that the floating floors used in the university center and in many others could be one reason why little damage was incurred.

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Trial Adoption

New Terminal Expands Medical Applications

LOMA LINDA, Calif. – A CRT display, which serves as a blackboard for medical pictures or diagrams drawn by a distant computer, will be tested as a physician's instrument during the coming year at nine institutions across the country.

This terminal, capable also of sending information or queries to the computer, was designed by Dr. Ivan R. Neilsen, head of the Scientific Computation Facility at Loma Linda University, and has been in use for research and patient care at the LLU Medical Center for the last three years. It enables doctors with no technical computer knowledge to automate some part of their diagnostic and treatment procedures by making use of the storage and speed of a large computer facility.

At Loma Linda, a collaboration of five years between computer scientists and clinicians who are also working in research has already developed a number of important medical applications for the new terminal; more are being investigated.

Some of the medical tasks the terminal could perform in a doctor's office or hospital, and its general capabilities, were demonstrated to about 100 medical researchers at a conference here. They saw how it could be used, for instance, to help the physician diagnose heart patients or those with pulmonary or hormonal problems (emphysema, diabetes, etc.) The conference was called by the Biotechnology Resources Branch of the National Institutes of Health.

From these and other interested scientists, who were invited to submit proposals for their own use of the Loma Linda terminal, the Biotechnology Resources Branch will shortly select eight proposals. Each scientist will receive a terminal with which to try out his proposal in his own institution.

In addition, Loma Linda will operate 10 of the terminals here – eight to be used in different departments of the Loma Linda University Medical Center; and two, assigned to the Regional Medical Program of this area, to be tested a few months at a time in clinics, small hospitals, and private doctor's offices away from the campus. These two will be joined by telephone cable to the University's computer facility, and will be used by doctors in the area as a kind of specialist consultant via computer.

Simple language enables a doctor to communicate directly with a computer and receive a comprehensible response in the same moment.

The most impressive example of such time- and dollar-saving use of the terminal has been developed by Loma Linda cardiologists for diagnosing heart patients. Drs. Allen F. Bowyer, and Roy V. Jutzy, assistant professors of medicine, demonstrated techniques which they and their associates have developed for the terminal in the Heart Catheter Laboratory.

They use the examining instruments familiar to most cardiologists – a catheter threaded through one of the arteries into the chambers of the heart; a densitometer attached by tube to an artery in the arm; an x-ray movie camera which, because of the dye injected by catheter, can show moving pictures of the blood flowing through the beating heart and its arteries.

For example, using a Flying Spot Scanner to measure the dye seen in the X-ray movie picture of the patient's heart, they instruct the computer to take the Scanner's data and calculate left ventricular volume at different moments. This measurement is important because the left ventricle is the heart's major pumping chamber.

The Loma Linda team led by Bowyer has also developed a program in which the blood pressure data, transmitted by catheter, can be calculated by the computer for any of 23 important areas of the heart. In response to such a query, the computer draws a heart diagram showing all the chambers and valves, and prints the pressure figures on the diagram in the appropriate spots.

In a typical situation, Bowyer estimates, it would cost a physician from $40 up (a low average of present fees) to analyze the data obtained in blood pressure, cardiac output, and left ventricular volume studies. Doing the same (typical) number of diagnostic procedures – four measurements of cardiac output, two sets of pressure measurements, four measurements of left ventricular volume (two at rest and two contracting) – but using the computer and graphic terminal and including their time costs, adds up to about $13.

University Centers Face Bleak Future

(Continued from Page 1)

Funding for computer centers unfortunately has ominous beginnings in that they have been mainly or entirely supported by federal, institutional or corporate grants. By comparison, the library at UCLA is entirely supported by the state. Knopoff explained there has not been just recognition for the center as it serves the academic community in the same way that the library does.

The UCLA library grows at an annual 2% budget increase, but the library is used to this gradual increase and on its base, 2% is considerable. Computing has grown in the university community tremendously without any incremental financial support. Several university officials cited the library example with envy and speculated on the possibility of tapping some of these funds. The UCLA computing center has one-tenth of the funds that the library has from state sources.

"The function of a university is to generate new ideas and act as a place where young people can be stimulated to think along different paths. The paths in computer sciences are very worthwhile," said Knopoff.

Insufficiently Developed

Knopoff cited three areas as examples where computers are not sufficiently developed:

- Graduate research – the tradition has been that federal funds would pay for it. The state pays nothing for this area of work. This excludes much "imagination" work.

Use of computers in the classroom – no tradition exists for support of activities for computer use not as just a teaching textbook but as sophisticated interactive parts of instruction. Fantastic control situations of data could be introduced into classroom activity. There is no source today to fund this type of exploratory work.

- Computer sciences – we are still working with Von Neumann number crunchers. Computer centers are job shops for this. Research could be done into new methods such as symbolic computers, so that problems could be solved symbolically or in other intelligence media. Now problems are solved numerically, only inhibiting much field work.

UCLA, like other universities, has five possible but not encouraging solutions to its financial problems, according to Knopoff.

- Pass the hat to major industrial corporations and institutions.
- Go to the state for more funds – a dim prospect in view of budget cuts and freezes.
- Sell time to other non-profit institutions such as universities and utilities.
- Retreat to a smaller computer. (In cases such as Caltech's, this wouldn't help. Caltech has present equipment leased under an educational discount from IBM, but as IBM has dropped this policy Caltech would have to pay full price for smaller hardware.)
- Give up its center and be taken over as a university multi-campus network.

Let's Drink to That

LONDON – Computer supervisor Michael Crew moonlights by drinking beer. A tavern in Charlo, Mont., is decorating its walls with unusually labeled bottles, and pays Crew for each empty beer bottle he sends.

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13 Unit Record Machines Stolen

By a CW Staff Writer

OAKLAND, Calif. – The disappearance of 13 unit record machines valued at more than $50,000 has prompted local police to seek help from the DP community in locating the missing equipment.

Oakland Police have published a list of the machines and their serial numbers, and have asked repairmen and potential customers to be alert for the stolen equipment.

All the equipment, stolen from a warehouse, was made by IBM but is owned by MAI Associates of Mill Valley. A police official told CW there was other equipment "available," but only the IBM machines were taken.

The thefts were apparently discovered over a period of time, as Sgt. Marvin Goldberg said he was working with two separate reports covering these thefts "over the past year."

The latest loss included three IBM 083 sorters, a 407 accounting machine, two 514 reproducing punches and two 519 document originating machines. Earlier, a 407, two 514s and two 519s were taken from the same warehouse.

IBM Equipment Serial Numbers

083 sorter	23526
083 sorter	18921
083 sorter	27538
407 accounting machine	24102
407 accounting machine	25754
514 reproducing punch	27162
514 reproducing punch	20785
514 reproducing punch	25068
514 reproducing punch	50518
519 punch machine	91374
519 punch machine	16409
519 punch machine	14856
519 punch machine	22317

While the machines could have been taken outside the country, there is a "chance that they still are in the U.S.," Goldberg observed.

In asking computer people to be "alert" for the machines, he said organizations should "contact me if they should locate any one of the missing machines so we can put a stop to these thefts."

A regional FBI office could also be notified, Goldberg added. Since the machines are valued at over $500 each, their serial numbers and descriptions should be entered in the FBI's crime data bank.

The storage warehouse is "not a company warehouse," according to an MAI spokesman, who declined further comment because the company is currently in registration proceedings with the Securities Exchange Commission (see Page 25).

Neither MAI nor the police department would identify the owner of the warehouse, who filed the complaints of theft.

McCracken Renews Fight Against ABM

CW New York Bureau

NEW YORK – If the System 360 Operating System had 5,000 mistakes – after it was fully tested by IBM and released to customers – how is it possible to expect the antiballistic missile (ABM) computer system to have no mistakes at all?

This is the question asked by Daniel D. McCracken, chairman of Computer Professionals Against the ABM, who has begun his second annual campaign to convince the Senate that the ABM computers won't work.

Learning from his lack of success last year, McCracken has turned the campaign into a full-time job – speaking to professional societies in states with uncommitted senators and button-holing the senators themselves.

This year he has more help. A public relations firm has volunteered aid, and the members of the organization's executive committee are taking a more active role.

Members of the executive committe are: Paul Armer of the Harvard Program on Technology and Society; Joseph Weizenbaum, Professor of Computer Science at MIT; and Gregory P. Williams, a computer technologist in Phoenix, Ariz. The committee itself reports that it has over 500 members from the computer profession.

McCracken cites three reasons why he believes the ABM computers won't work:

- Realistic testing is impossible because it would require nuclear explosions in the atmosphere.
- The precise nature of the computing task can never be defined because the enemy is always improving its countermeasures.
- "Evolutionary development, critical to the success of every known successful computer system, is out of the question. The Safeguard computer would never be given a second chance."

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Multiple Power Problems Continue To Plague East Coast DP Users

NEW YORK – Power problems plagued the Eastern seaboard through the first half of February, with voltage cutbacks enforced from Washington to New York City. Manhattan had a blackout.

New York experienced its seventh voltage redution of the year as a result of dwindling reserves, which on one day dimished to zero.

Then a blackout was blamed on a mysterious "explosion" in a transmission facility or, as a Con Ed spokesman noted, "We had too much power and no place to put it."

Only one user contacted by CW had an emergency backup power unit, but was not forced to use his spare.

There have been cutbacks in the Pennsylvania-New Jersey-Maryland grid, which serves those three states plus Virginia. The District of Columbia also had 5% reductions imposed by the Potomac Electric Co.

Recycling May Include Printout

WASHINGTON, D.C. – The government is investigating the possibility of computer printout sheets and punched card stock in a paper recycling program aimed at improving the environment.

Calling the nation's solid waste program "costly and damaging to the environment," President Nixon told Congress that the Federal Government has initiated a procurement program to encourage recycling of paper and use of recycled paper.

Over one-half of the General Services Administration's paper product purchases are involved in the program, the President said in a message on the environment sent to Capitol Hill.

All remaining specifications – and that would include computer printout sheets and punched card stock – will be reviewed to require recycled content in as many paper products as possible. And there will be an effort to increase the percentage of recycled paper required.

News Wrapup

Bars Increase for Alien Workers

WASHINGTON, D.C. – Computer experts from outside the U.S. will find it more difficult to enter this country to work, and foreign keypunch operators will not be certified at all for jobs in the U.S.

A new ruling issued by the Department of Labor amended the regulation for certification of alien workers to enter the U.S. for employment.

Most of the prospective immigrant workers who previously could have been certified by virtue of their occupation alone will now need an individual review by the Labor Department before entry, Assistant Secretary of Labor Malcolm R. Lovell Jr. announced.

Gallagher Again Seeks Technology Committee

WASHINGTON, D.C. – Rep. Cornelius E. Gallagher (D–N.J.), who has been conducting privacy studies for the past six years under the aegis of the House Committee on Government Operations, has renewed an appeal to the House to establish a select committee on privacy, human values and democratic institutions.

This investigation would include "the role and effectiveness of computer technology in the operations of industry and government, the consequences of using computers to solve questions which traditionally have been addressed without the assistance of computers and other machines, and the effects of technology and machines on democratic institutions and processes."

Detroit Settles out of Court in Vote Suit

DALLAS – The Common Council of the City of Detroit has voted to accept an out-of-court settlement of the city's suit against Datamedia Computer Services Inc. of Dallas.

The council ordered the city's attorneys to bring a $1 million action for damages against the firm that brought punched card voting to Detroit and which handled both the botched-up August primary and the November general election [CW, Dec. 2].

The supposed settlement offer amounted to $430,000.

The council's vote was six to two, with one council member abstaining.

"We have," said Thomas Schoen, president of Datamedia, "not yet accepted it [the supposedly proposed settlement figure]."

Resistors Issue Call for Papers for SJCC

PRINCETON, N.J. – A call for student papers has been issued by the Resistors (Radically Emphatic Students Interested in Sciences, Technology, and Other Research Studies) for the 1971 Spring Joint Computer Conference, May 18-20, in Atlantic City, N.J.

A title for the paper should be submitted immediately. Instructions concerning format and presentation will be sent upon receipt of the title. A short summary of about 100-150 words should also be sent as soon as possible, and the paper itself must be received by April 1.

Some suggested topics include: new mathematical or gaming algorithms successfully implemented on a computer; CAI programs; new interfaces and peripherals; heuristics programs; artificial intelligence; design of a new special-purpose language or instruction set; and computers in the fine arts.

Replies should be addressed to Resistors, Lauren Sarno, Secy., 62 Erdman Ave., Princeton, N.J. 08540.

Spring Joint Panel Accepting 'Mini-Papers'

MONTVALE, N.J. – Computer users and engineers can bypass the early deadline for normal technical papers submitted to the Spring Joint Computer Conference by preparing short technical notes, called "mini-papers" by the technical committee.

This will enable interested persons to cover recent innovations in hardware, software, systems and related topics which could not be adequately covered in the regular technical program because of the early deadline, which has long passed.

By March 15, authors must submit five copies of their paper (limited to 2,000 words), plus a 100-150 word abstract to the Technical Program Committee Chairman, Dr. Nathaniel Macon, Box 30130, Bethesda, Md. 20014.

County Favors Fully Automated Judicial Plan

DALLAS – The first Texas county to completely computerize its entire judicial system will be Dallas County, if officials have their way.

Their way in this case means $1.6 million in federal aid and approval of the district judges.

Intended for computerization are all the records of the sheriff, district attorney and district judges. While the target date is 1975, some officials have estimated it would take up to 10 years to transfer all the records onto computer tape.

Jury selection, court index and docket systems have already been placed on tape, in anticipation of the integrated system.

The county's request for a federal grant has reportedly been approved by the county commissioners, an essential step in the federal funding procedure.

Navy Adopts Square Approach With DP Cards

TONAWANDA, N.Y. – Careful evaluation does pay off.

Rep. Henry P. Smith of North Tonawanda has received word that the Department of the Navy has granted his appeal in support of a Moore Business Forms Inc. request for an "exception to specifications" on a $1 million computer card order.

The Navy had previously insisted on using a rounded-corner card rather than Moore's square-cornered card at an annual higher cost to the taxpayer of more than $100,000.

Memorex presents a startling breakthrough in 1403 printer ribbons:

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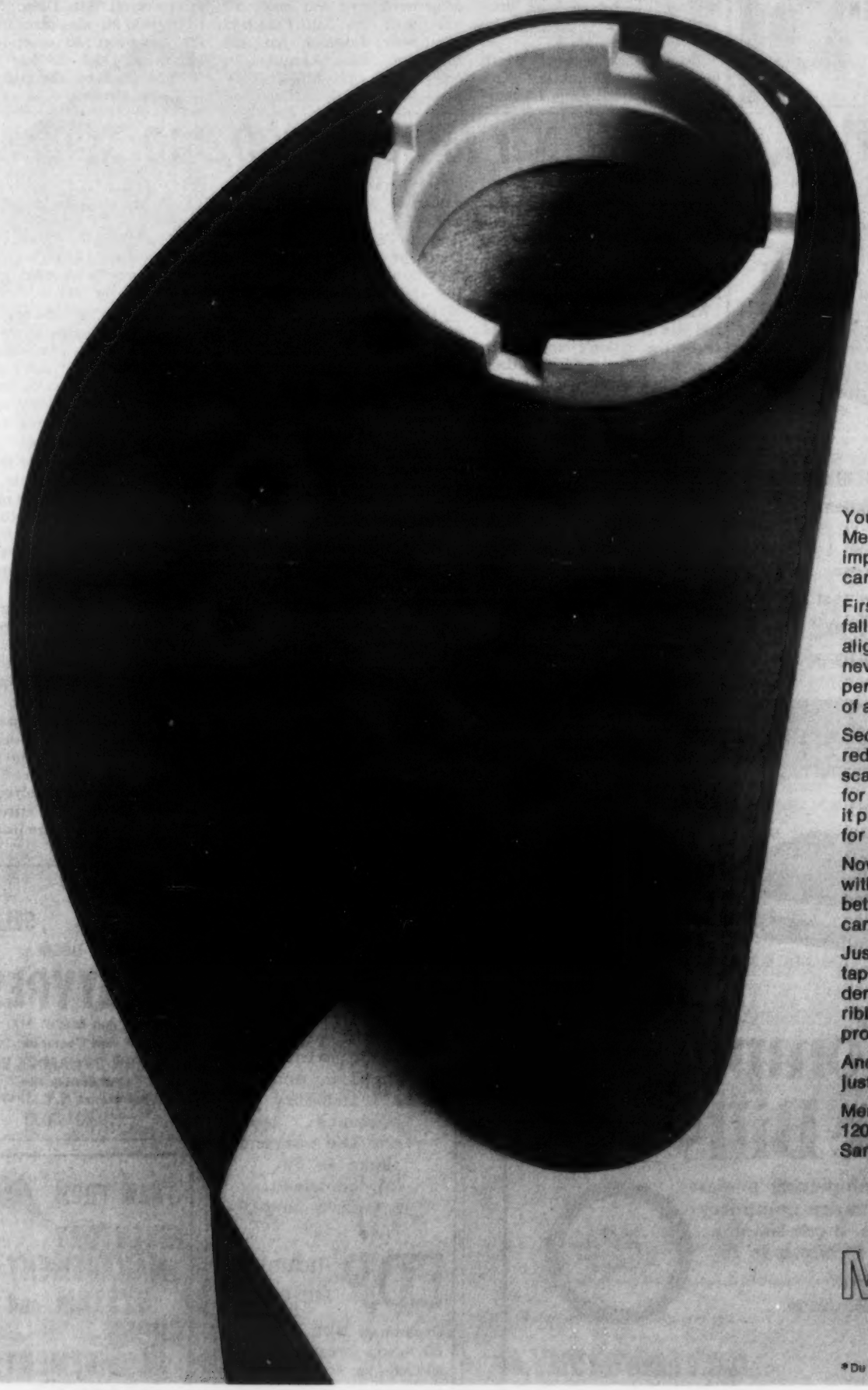

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Time-Shared Music Bridges Gap

SUNNYVALE, Calif. – The East West Music Ensemble has been presented a grant of $10,000 of time on the Tenet 210 computer to develop a multifunction music system for such tasks as composition, transposition and converting to and from Oriental and Western notation.

The award was presented by Tenet President William H. Bridge to Erh Lin, director of the ensemble.

Professionals and students of both music and EDP attended the reception for a demonstration of "time-shared music" using a terminal connected to the computer by telephone lines.

Erh Lin instructs the computer to translate a composition from Western music notation for kotoist Sumi Honnami, accompanied by violinist Marjorie Lin.

On-Line Composition

The demonstration began with on-line composition by Yuji Takahashi, avant garde Japanese composer-pianist and guest soloist with the San Francisco Symphony. Takahashi has used the Tenet Basic Language to compose (in only four days) an hour-long composition for a performance at San Diego State University. He also plans to use the computer to compose a piece for which he has been commissioned by the Ojai Festival of California.

Houston Net to Reach 200,000 Students

HOUSTON – A regional high-school computer-communications network has been initiated here, and will eventually provide computer training for 200,000 students in the greater Houston area.

When the network grows to full size in 1972, it is expected to be the nation's largest such system offering specialized computer training to high school students.

A similar system in Minnesota serves almost 245,000 students, but about 70% are in grammar school.

The Texas network is built around an RCA Spectra 70/46 and 70/45 installation at the Region IV Education Service Center here. T.S. Hancock, executive director of the center, said the system would be used in mathematical problem-solving and the learning of computer skills, plus classroom scheduling, grade and attendance reporting, test scoring, tax accounting and other administrative tasks.

Hancock said 67 teletypewriter and 10 RCA card reader-printer terminals, each linked by phone line to the computers, are already serving 10,000 students in 34 of the region's 56 school districts.

An additional 53 teletypewriters and 10 card reader-printers will be installed in high schools by the end of June.

"This number of terminals should then provide a complete educational data processing capability for all of the region's 225 secondary schools and an administrative capability for all schools within the region," he noted.

Using classroom time-sharing terminals and the Basic Language, students can solve mathematical problems associated with chemistry, physics, physical science, computer science and general mathematics courses, Hancock stated.

Student training in computer operation and program preparation, offered in vocational-technical and computer science courses, is handled through the card reader-printers.

Hancock explained that student problem-solving, vocational-technical training and transmission of administrative data is conducted simultaneously through the teletypewriter and card reader-printer terminals.

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HOW do things look for the computer industry as the pause in growth apparently is ending?
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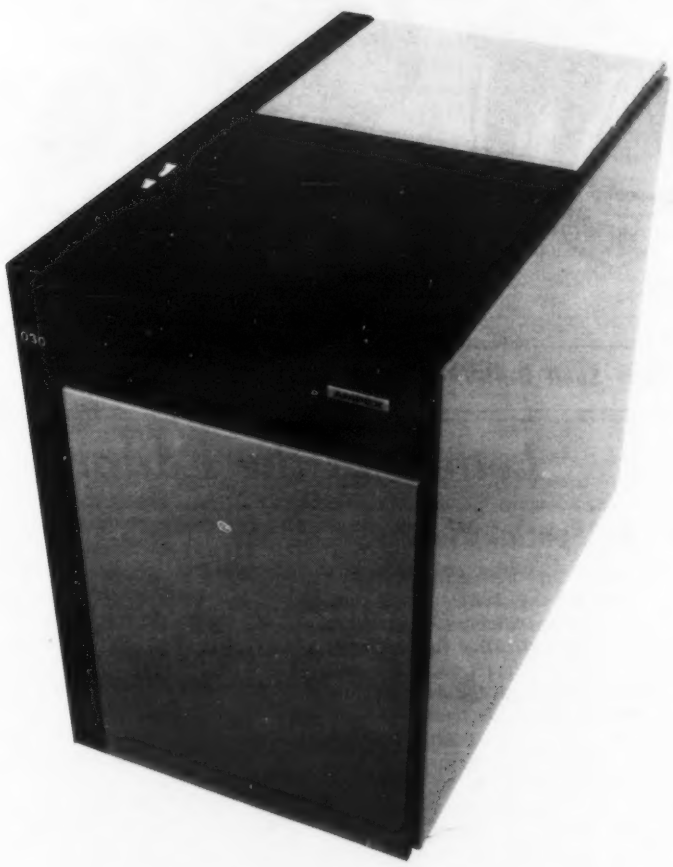
NEW FROM
INVENTORY MANAGEMENT SYSTEM and GROSS REQUIREMENTS PLANNING See P.20

It had to happen ...and it did.



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Editorial

Matching Supply and Demand

For the first time, we have a national surplus of experienced computer people. If a way isn't found to keep them in the field, they will be gone when demand again exceeds supply.

Meanwhile, the cost of business automation has dropped to the point where many small businesses could profitably make use of it. But many small businessmen shy away from computers because they know enough to be very wary and not enough to feel safe in contracting for systems or services.

These two problems could be solved simultaneously by funding the Small Business Administration to hire surplus business DP people as consultants. The SBA could then hold applications seminars and provide individual counseling for small businessmen with unusual DP needs.

The arrangement would mean new jobs for DP people, vital information for small businessmen, and new markets for the computer industry. Everyone, and the economy as a whole, would benefit.

'...Put Them All Together, They Spell U-NI-VAC One--the Sweetheart of the O-E-M...'

Overall DP Industry Approach Lacking From Labor Hearings on Exempt Status

WASHINGTON, D.C. – Is a programmer or a systems analyst a professional?

This determination of status is being considered by the Wage and Hour Division of the Department of Labor, and in hearings held in Washington recently the agency sought help from the computer industry.

Unfortunately, the industry offered minimum assistance.

Perhaps one fault was that the division might not have made itself clear as to what it wanted. It needed suggestions to help it develop guidelines which could lead to changes in the Fair Labor Standards Act affecting DP workers. The act covers minimum wages and overtime pay compensation.

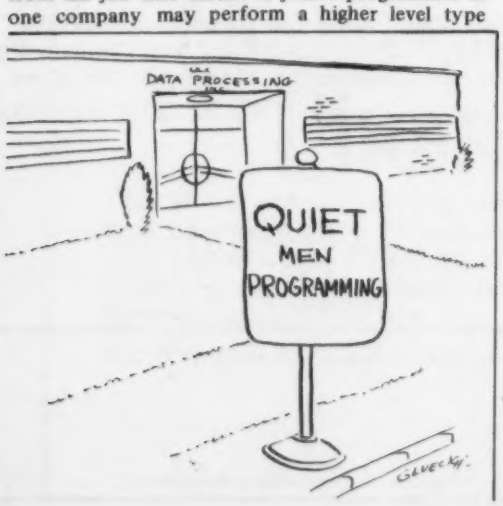
D.C. Data-Line
By
Alan Drattell

But the fact remains that aside from a suggestion by Walter E. Carlson, president of the Association for Computing Machinery, the hearings provided a platform for the self-serving interests of segments of the computer industry.

Carlson asked the Federal Government to set up temporary rules using salary as a factor in determining professionalism. The income standard he suggested was about $10,000 a year.

Job Title

Most of the individuals testifying agreed that it is difficult to tell whether a man is a professional from his job title alone. A junior programmer in one company may perform a higher level type function than a junior programmer in another firm. Content of the job makes the difference, they agreed.



But when the self-serving testimony became evident, an observer had to sympathize with the hearing examiners.

It helped to complicate their task since it was obvious from some of the questions they asked and from some of their commentary that the examiners had little knowledge of the computer industry. One of them, for example, asked for an explanation of software. After it was given, he commented, "I can't say I understand."

And the examiners apparently had little understanding of Dr. Herbert W. Robinson's distinction between unit record and computer installations. Robinson, appearing on behalf of the Association of Data Processing Service Organizations, opted for declaring everyone above keypunch operators professionals. This action would obviously help Adapso members who would then be exempt from paying overtime wages to machine operators as well as programmers and systems analysts.

Paul C. Notari, president of the Association of Computer Programmers and Analysts, said that once an individual has fully qualified as a junior programmer "he is by all definitions of the word a professional." Junior programmers are, of course, eligible for membership in Acpa.

Missing from the hearings was an overall industry approach. Except for the testimony presented by ACM. It would have been much more telling, if Afips, DPMA and some of the other stellar associations in the DP industry had been on hand along with ACM to present one total view.

The problem is, of course, there is no one view that everybody can agree upon. Each is too interested in his own. We have seen this evident in many other instances.

For example, the squabbles between ACM and DPMA in the past have to date prevented a common set of guidelines from being created to aid those interested in attending private DP schools. And there has been a scatter-shot approach to easing the unemployment crisis in the DP industry; but typically there has been no concerted effort to lobby for effective action by the Federal Government to retrain out-of-work aerospace computer people for other areas of need such as pollution and urban planning.

The testimony presented at the hearings points out quite glaringly that the industry's problem is not only determining whether programmers and/or systems analysts are professionals, but whether we as an industry can conduct ourselves as professionals.

Letters to the Editor

A 'Special Place'

The day before, I had just returned my students' first computer homework problem. Upon entering my office this morning, I found a small deck of cards had been slipped under my door. When printed they read:

TO------MR. -----S-T-O-N-E----
I TOOK THIS COURSE COZ I THOUGHT WE,D BE WORKIN, WITH DECKS O, CARDS MY CARDS HAVE A SPECIAL PLACE IN THE SORTER OF THE COMPUTER,---MARKED---REJECTS WHEN I USE THE KEYPUNCHER CARDS HOP ALL OVER THE PLACE EXCEPT IN THE HOPPER I BET THE COMPUTER CAN,T COMPUTE ALL THE HOURS I SPENT IN HERE WORKING IN THIS PLACE, WHO NEEDS THE EXPENSES OF A DORMITOR Y

Fred W. Stone

Tuskegee Institute
School of Engineering
Tushegee, Ala.

Compiler Table Erred

It has been brought to my attention that the table published with my article "Standardized Cobol Compilers Give User Flexibility" (Jan. 27, Supplement, Page 3) is incorrect for two of the manufacturers. General Electric's ANS compiler is completely high level and RCA's compiler implements the high levels of Table Handling, Report Writer and Sort.

Harry T. Hicks Jr.
Director, Consulting Services

Information Management Inc.
San Francisco, Calif.

DEC Has ANS Cobol

In your 1971 Software and Measurement Supplement [CW, Jan. 27] Harry T. Hicks has an article discussing ANS Cobol. Included is a table of current ANS Cobol compilers. The PDP-10 Cobol of Digital Equipment Corp. was omitted.

In September 1970, Digital released an ANS Cobol for the PDP-10. The compiler includes the highest levels for all features listed, with the exception of Table Handling (Mid), Report Writer (not included) and Interprogram communication. The compiler can call Fortran and Assembly subroutines, but Cobol programs themselves may not be subroutines.

Late in 1971, the high levels of Table Handling and Report Writer will be included in PDP-10 Cobol, as well as the ability to handle Index-Sequential file structures. Interprogram communication, including Cobol subroutines, will be added later.

Al Blackington

Digital Equipment Corp.
Maynard, Mass.

That's Cherry Hill, N.J.

Enclosed is a copy of an article [on Cobol conversion which appeared in Random Notes Jan. 27] which lists an incorrect address. The address for Computer Dynamics Corp. is 401 Cooper Landing Road, Cherry Hill, N.J. 08034.

Brian E. Lister
Sales Manager

Computer Dynamics Corp.
Cherry Hill, N.J.

IMS/360 Interface

Thank you for the article describing our "High Speed Dump, Reorganize, and Reload Program" in the Dec. 16 issue.

Unfortunately, it failed to mention the unique ability of this data base dump to interface with IBM's IMS/360. It is for this reason that our users have purchased this package, and I expect that this reason accounts for 90% of the interest in our package.

A.L. Frank
President

Systems 2000 Corp.
Houston, Texas

Too Much Ambiguity

Arrogance Thrust Upon Analysts

Dear Mr. Strunce.

Thank you for inviting me to suggest ways of improving communications with your computer staff, and to suggest wording which will explain more clearly to the public just what you are charging them for cash advances.

Regarding your difficulties in communicating with your computer staff, I think that your first action should be to stop setting them an impossible set of tasks.

A computer program, as I assume you know, operates only a single way which is predetermined. It cannot be expected to operate for different people who have, unknown to it, different contractual relations with you. As such, when you advertise the rates on your cash advances in three different documents, with four different and potentially contradictory descriptions, you are asking the computer to do the almost impossible.

You are asking it to interpret the same input data of payments in a single way, and yet to satisfy the various different ways that you have promised your clients.

If you will look at the two different cash payment schedules, (the one you send out with statements and the different one you send out with new cards) and at the cash draft itself, you will see three different versions of the time that you charge interest on cash advances also. Not merely are all three different, but they are all ambiguous.

The one on the cash advance draft is perhaps the clearest in that it promises people like Slabey that payments received by a due date will be credited as from that due date.

If this promise had, in fact, been honored, Slabey would never have claimed that you overcharged him. On one of the schedules this promise is omitted, and instead, the payment interest continues until a due date on some undefined billing statement.

Whether or not that is a billing statement that has been provided to the borrower, or, as you are now claiming, additionally qualified as being only a billing statement on which you happen to have printed the details of the cash advance concerned, is left undecided. On the other rate schedule you just give up on the due date entirely and describe the interest as continuing until 25 days after the billing date of the account.

This may, but need not, be the "due date." Again, there is ambiguity in the word "account." Does this mean the account of the person receiving the loan, or the account of the loan itself? You do not state.

Moreover, as opposed to these fine print statements, you include in bold letters, a different statement that the rate charged was equivalent to 12% annual interest. People borrowing and relying on that unqualified and boldly placed statement can reasonably claim that what they have agreed to is paying 12% and nothing else.

A systems analyst is not a lawyer. If he is to survive in banking employment, you cannot expect him to stick his neck out and demand that every description of a loan interest calculation be checked with him and approved by him before you publish it.

And yet, unless you do this, you are not giving your analysts a chance. No matter what they do, in the face of such confusing and ambiguous definitions of what they are supposed to do, you will have trouble in communicating both with them and with your borrowers.

I suggest, therefore, that you take the necessary measures to eliminate totally such ambiguity, and that in the meantime you instruct your systems man that in the case of all such ambiguities the programs should always adopt the interpretation which is least costly to the borrower – because, after all, he did not write the ambiguous definitions.

Regarding your second invitation to suggest clearer wording, I think it is quite easy. As you said, you are actually charging "interest" during a period of up to 55 days after the loan has been repaid to you. (I make it 56 maximum, incidentally, 31 days of a monthly cycle plus 25 days to the due date). This is not interest on money outstanding but is simply a service charge.

Calculation as to what it happens to be is an internal thing to yourselves; therefore, I suggest the following phrasing:

"Borrowers will be charged up to 1.9% of the principle (equivalent to 56 days interest) service charge plus interest at a rate of 1% per month for the duration of the loan. For example, a borrower of $300 may be charged $5.67 even if he repays it instantly." Of course, you may have some problems with your salesman, or with the Pennsylvania State Banking code, but these phrases would be telling it like you explained it to me, and would not be misunderstood there.

I look forward to hearing your attorneys' comments on my suggested draft, as you promised.

Very truly yours,
Alan Taylor, CDP

P.S. One useful thing your computers could easily do would be to review the "interest' charged in the past – and to calculate refunds due to those of your customers who may have been overcharged.

Restrictions Imposed

Previous articles on billing and other horrors have stressed the role of the systems analyst – quite forcibly. But, in general, he is restricted both by the instructions that he receives from management, and by the equipment that he is expected to use. This week his problems in both these areas are considered.

On the left is a copy of a letter sent to Robert Strunce, vice-president of Bankamericard, at the Philadelphia National Bank, Philadelphia, Pa.

The letter is in response to his invitation to suggest ways of improving his communications with both his analysts (which he apparently finds frustrating) and with the borrowers such as Prof. Slabey, whose experiences were described last week.

Below, a short article pinpoints some of the deficiencies of the equipment that the analyst has to work with, which makes it often technically impossible, and often economically impossible, to access all the data available – and so provide better systems.

The systems analyst may be arrogant in his output, true, but perhaps the real trouble is that management and equipment manufacturers are forcing arrogance upon him.

Stupid Tapes May Be Cause

The Taylor Report
By
Alan Taylor, CDP

One of the most standard items on computers nowadays is the tape equipment. There are, of course, many types of magnetic tape units. But they differ only in speed, error correcting capabilities, etc. They are all "stupid" tapes. That is to say the central processor has to send out every single read or write instruction, has to do every compare, etc. The central processor has to be a bottleneck – and it is.

The stupidity of those tape units can be seen by comparing them with those on the Univac File Computer in the late 1950s. Here the file can be mounted on multiple drives, and each separate drive could move its tape forward, could search the records, check for identifications so that they could either be merged, collated, or even completely sorted without bothering the processor.

Alternatively they could identify which records the central computer system wanted to access. When, and only when, such a record was found which the computer system had asked to see, was the action taken out of the tape drive area and put into the central computer.

With this design, for instance, it was possible on a 16-tape system, for which I once did the system design, to have 16 tapes searching simultaneously. Each tape had been told which of the next items that were to be reported to the central computer, and the central computer was prepared to deal with any of the 16 next items. This way, with a certain amount of additional control information (which certainly was then expensive, but nowadays could be quite cheap) a complete history could be used to provide the information from the file – in 1/16th of the time that would otherwise have been required.

Good Old Days

But we do not have intelligent tapes now, not like in the 1950s. The amount of transaction data that can be held economically is therefore limited, and at times inadequate. System designers have accepted the (false) fact that if they hold data on tape it cannot be easily accessed.

Nor can disks replace tapes. They also have the controller bottleneck, but even more serious is the fact that they are both costly and limited in their maximum capacities. A designer must take these points into account, and often trades off the complete use of the information that he has available in the system, so as to make his application fit onto the equipment available – although that is fundamentally unsuitable for applications like billing.

Perhaps, then, the technical reason for the billing fiasco is simply that billing equipment is not currently on the market – and that we are being forced to use unsuitable hardware.

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Here's a Case for Return of 6-bit Byte

By Charles W. Snover
Special to Computerworld

I would like to make a case for the return of the 6-bit byte. Consider the following analysis.

Before the advent of packed data, it required only six bits to represent any one of 64 possible symbols. This was two more than required to represent the 10 decimal digits and it appeared to be inefficient.

Viewpoint

By going to an 8-bit byte it was possible to store one decimal digit per four bits and thus get 50% more numeric data in core. This was achieved at the expense of character data which now requires 33 1/3% more core.

The gain in numeric data is not really 50% because many numeric fields must carry a sign. If you consider that it takes 32 bits to represent either six or seven digits plus a sign we can assume a fairly representative mix would approximate 5 bit/digit. This would represent an increase in efficiency of only 25% for numeric data.

Under the 6-bit byte system it would require 600 bits to represent 100 characters. The following schedule shows how many bits would be required for various mixes of characters and numeric data under the 8-bit system.

8 bit Alpha	5 bit Numeric	Total Bits
100	0	800
80	20	740
60	40	680
40	60	620
33-1/3	66-2/3	600 (Break-Even)
20	80	560
0	100	500

The schedule shows that any time the mix contains 33-1/3% or more of character data, a machine designed around the 8-bit byte is paying a penalty.

I do not know what the average percentage of character data is in a commercial environment but 33-1/3% does not seem unreasonable. If true then, on the average there is no gain.

The price does not end there. It also takes additional hardware instructions and it requires the programmer to be constantly aware of data format.

It makes it more difficult to create generalized applications packages and file maintenance systems.

It seems that the computer manufacturers worked on the wrong end of the horse. The cost of core and disk storage per byte is constantly decreasing while the cost of programming and systems is increasing. New computers should be easier to use, not harder.

One final comment. Many of the earlier computers, such as the IBM 650, 7070 and the Burroughs 205, used two decimal digits to represent a character. On this basis wasn't packed decimal a step backward?

Also, if anyone fears that we would lose lower case alpha if we returned to the 6-bit byte, just as a big a case could be made for the inclusion of roman numerals.

Charles W. Snover is vice-president, production, for Information Dynamics Inc., Indianapolis, Ind.

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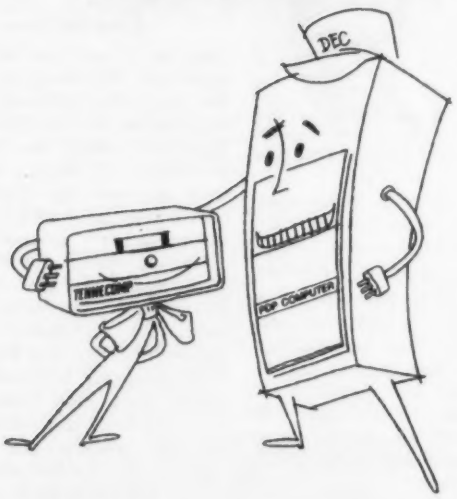

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Viet Navy Supply Section: Where East Meets West

SAIGON – Rudyard Kipling's famous statement about East and West never meeting seems greatly out of place in the supply section of the Vietnamese Navy headquarters here.

The Vietnamese Navy, with its mushrooming inventory of supplies, boats and men, contains such contrasts as modern electrical accounting machines being used to keep track of replacement parts for wooden junks.

Although the combat riverine craft the U.S. turned over to the Vietnamese Navy are somewhat sophisticated weapons systems, much of their Navy is still made up of armed wooden junks. Therefore, the switch to a computerized navy typified a contrast not uncommon in many Asian countries.

A training course in the programming and operation of electrical accounting machines is currently under way at the Vietnamese Navy Training Center in Saigon.

Instructing the course is Vietnamese Seaman Du Chi Vien who distinguished himself by graduating first in his class at the U.S. Navy's DP school in San Diego, Calif. Vien also went on to graduate from an advanced U.S. Navy school where he learned computer programming.

Students are taught how to punch out data on IBM cards both manually and automatically. They also learn the operation of eight IBM accounting machines.

Lesson plans for the 14-week course are prepared by U.S. Navy Chief Petty Officer Jose A. Toro who supervises the curriculum.

Toro, a 14-year navy veteran, previously served as an instructor at the U.S. Navy's DP school at San Diego.

"The Vietnamese sailors here are eager students," Toro said. "They realize that such sophisticated machines can play an important part in the growth of their Navy."

The advantages of having a Vietnamese instructor rather than an American are obvious. Because one of their peers learned to operate the highly technical products of electronic wizardry, and is now teaching their use, it is hoped the Vietnamese sailors will have confidence that they can also learn to operate the computers.

Tagged

Checking for stolen or counterfeit airline tickets at the Los Angeles International Airport, a passenger agent at United Air Lines uses a special-purpose computer, with 23 keyboard terminals, developed by TRW Data Systems. After keying ticket number, an instantaneous response by green or red light indicates whether ticket is good or stolen.

N.C. to Link With NCIC

RALEIGH, N.C. – The state of North Carolina will soon join the growing list of computerized state law enforcement networks linked to the FBI's National Crime Information Center, when the Police Information Network (Pin) is established.

The governor's committee on law and order has recommended and funded the operation.

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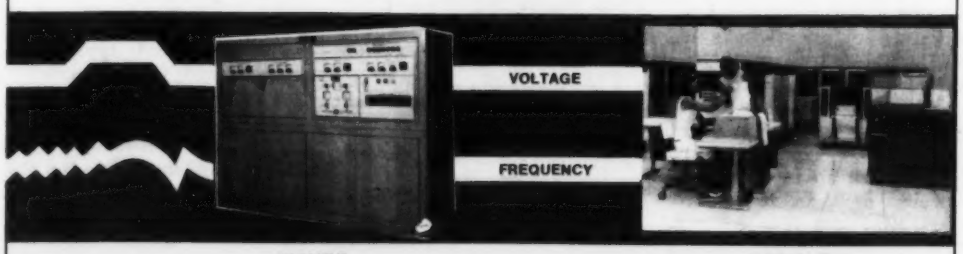

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Random Notes

HP Adds Fortran IV To Compiler Library

PALO ALTO, Calif. – Users of Hewlett-Packard computers can now write source programs in extended Fortran IV. The HP language conforms to Ansi specifications, with extensions for easier use and more flexibility.

Two versions are available. One compiles in an 8K DOS-M system or in a 16K DOS or RTE system. The other requires a 16K DOS-M or DOS system or a 24K RTE system.

Documentation and HP Fortran IV tapes can be ordered through local HP sales offices. Binary paper tapes cost $55. Binary and source paper tapes, with listings and documentation, cost $540.

ADR Enhances 'Librarian,' Includes Syntax Checker

PRINCETON, N.J. – Librarian, a source language retrieval and maintenance system, has been "significantly" enhanced, according to Applied Data Research, Inc. Current users will receive the modification at no charge.

The enhancements include:

- A Cobol system checker, which permits Cobol source programs to be checked for valid syntax.
- A reduction in the space required for disk and tape master files.
- A security feature which ensures that users update latest data sets.

Librarian is available on a three-year lease basis, for $3,600, from Route 206 Center.

Subscribers Use Super Basic On UCS-IV Time-Sharing Net

KANSAS CITY, Mo. – Subscribers of the United Computing Systems UCS-IV time-sharing service can now use Super Basic which includes extensive character string manipulation capabilities.

The Super Basic user can handle complex and logical variables, use 24 files at one time, and gain accuracy to 14 significant digits, according to UCS.

UCS-IV provides toll-free service to 36 cities. From a single computer center, common data bases are accessible to multilocation users in either time-sharing or remote batch environments.

OLS Switches to Open CPU

PITTSBURGH – A communications front-end system recently added to the OLS time-sharing network provides users with easier, more dependable access, according to On Line Systems, Inc., the operator.

The new communications monitor processes all requests into a single queue and feeds them to one of three OLS PDP-10 processors.

The OLS network provides dial-up service to 15 eastern cities. The firm is at 4721 McKnight Road.

Spectroscopists Work on GE Net

FULLERTON, Calif. – Spectroscopists' data reduction problems can be solved with the multicomponent analysis and absorbance calculation program, from Beckman Instruments, and available on the GE time-sharing net.

The programs manage output data from an instrument system and perform all the necessary calculations to arrive at accurate results. Original data and calculated results are available for further processing.

Details are available from Beckman at 2500 Harbor Blvd.

Test Data Checks Cleared by 'Paid'

By Don Leavitt
CW Staff Writer

NEW YORK – The Programmer's Aid To Debugging (Paid) module from Mpirs Associates handles IBM 360 data checks automatically so that troublesome test sessions can continue. At the same time, the module allows operator intervention with more serious problems.

Paid operates under DOS/360 with Cobol and BAL program debugging, where the programmer is aware of core locations; but not with Fortran or RPG, where object instructions are insignificant to the programmer.

A transient module, Paid comes into core only when a program check occurs. If the problem is a data exception, Paid validates bad data fields, replacing invalid characters in a numeric field with zeroes or generating an arithmetic sign, and then continues processing.

The first time a specific data check occurs, it is recorded on the printer, along with the corrective action taken by Paid. The printout shows the Program Status Word (PSW), and the instruction code and addresses in the instruction where the data check took place. It also shows the original and revised contents of the corrected data fields.

Repetitive data checks, caused by passing through the same coding several times, are corrected although not recorded, Mpirs said.

Through external interrupts, a Paid user can produce "snapshots" of selected core locations, and can patch or branch to any location for further testing of the program. This capability is helpful to the programmer, the company noted, when the program is in an endless loop.

The Paid module can be catalogued and then made available for a test by adding two "Include" cards in the JCL stream. In use, Paid occupies 2,200 bytes of core. It costs $350, from 507 Fifth Avenue.

I/O Buffered, Spooled by 'Asap' While Application Programs Run

DANBURY, Conn. – DOS/360 users can spool their unit record I/O operations without a dedicated CPU partition by using the Automatic Spooling with Asynchronous Processing (Asap) system from Universal Software Inc.

Operating in upper core above the Foreground One partition, Asap is simpler to use than other spooling systems which require IBM's Multiprogramming Support. It permits I/O operations to begin as soon as the appropriate peripherals are available, in contrast to some packages that spool all output and do not start printing or punching until an application program has completed its run.

By permitting I/O operations to run at maximum speed, without interrupting program processing, Asap is said to improve performance and overall throughput by 20% to 40%, over non-spooled operations.

Asap uses core buffers for storage of I/O records and moves them to disk space only when the buffers are full. Since disk is used only for overflow, Asap normally needs very few cylinders compared to spooling systems that use disk for primary storage.

Asap requires approximately 2,500 bytes of storage for handling any number of card readers, card punches or printers, the company said. By contrast, IBM's spooling package, Power, takes 18K of memory.

The Asap package, which operates under DOS, can be purchased for $3,500, including maintenance, from 12 Horseshoe Drive.

Local Lines Listed

PHILADELPHIA – Users of remote computing capabilities can determine which of these services are easily accessible anywhere in the country, with the "Time-Sharing Phone Book" from Time-Sharing Enterprises Inc.

The book shows data lines and sales offices, available on local dial-up, for more than 1,000 cities. It also lists which networks provide In-Wats service, and in what areas this toll-free access applies.

The book costs $10, from 3401 Market St.

AED Programs Use Less Core, Execute Faster Than PL/1

WALTHAM, Mass. – Users can reduce object core requirements and execution times, by coding system programming tasks in AED-0 rather than in PL/1, according to Softech Inc.

Part of the Automated Engineering Design (AED) software system, AED-0 is a high-level, modular, machine-independent language originally developed at MIT with Air Force and industry support.

PL/1 and AED-0 are the only major languages designed with systems programming especially in mind, Softech said.

In recent tests, three system programming tasks were coded both in AED-0 and in PL/1. Softech claimed that the object code generated by PL/1 took 40% to 80% more storage space than the AED-0 generated code, on an IBM 360.

Even with the optimization mode, PL/1 usually took from 40% to 320% longer to execute than the AED-0 code, Softech continued. Only in the case of a logarithmic search algorithm in which an arithmetic loop predominates was the optimized PL/1 able to beat AED-0, the company said.

The AED system is in the public domain and is available from Softech, acting as the distributor for the Air Force, on a distribution cost basis.

Cost for the OS/360 batch version is $625 and for the CP/67-CMS time-sharing version, $675; maintenance for each system is available at $200 per month. On a nationwide time-sharing basis, users can access AED through National CSS.

Softech is at 391 Totten Pond Road.

'Qobol' Uses Abbreviations, Macros

WILTON, Conn. – Cobol programmers have another source language generator to consider with the availability of Qobol from Computer Resources Corp. (CRC). This package takes more core (a 65K IBM 360) but costs less ($275) than other similar systems.

The concept of Qobol is a reduction of typical Cobol statements into short mnemonics.

Qobol also provides a series of macro instructions for common procedures and the user is allowed to supplement these with his own macros.

Although the $275 package is normally delivered in source code form, CRC said that it would provide code for users who do not have a PL/1 compiler available. The firm is at 251 Danbury Road.

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Key Specifications:

Cycle Time – 1.2 microseconds.

Memory Capacity – Up to 10,000 8-bit bytes.

Console – Alphanumeric keyboard and digital display.

Card Reader – 200 cards per minute.

Card Punch – 30 cards per minute.

Disk Access Time – 72.5 milliseconds.

Disk Capacity – 2.3-4.6 million bytes.

Printer – 200 lines per minute.

Rental Range – $1,000-$3,000 a month.

A new expanded version of our hottest model.

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Key Specifications:

Cycle Time – 2.25 microseconds.

Memory Capacity – Up to 65,536 6-bit characters.

I/O Channels – Three standard, one optional.

I/O Transfer Rate – Up to 500,000 cps.

Disk Capacity – 9.2 to 147.2 million characters.

Disk Access Time – 62.5 milliseconds.

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Key Specifications:

Cycle Time – 1.6 microseconds.

Memory Capacity – Up to 131,072 6-bit characters.

I/O Channels – Eight, variable speed.

I/O Transfer Rate – 667,000 cps.

Peripherals – All Series 200 types operating below 500,000 cps.

Rental Range – $8,000-$18,000 a month.

Our hot new entry in the medium systems race.

Honeywell Model 2015

This system is an extremely powerful and sophisticated performer. Its capabilities range from single job stream to full dual job stream plus communications and as many as five data transcription routines – all operating at the same time. Our powerful OS/200 operating system offers the file centralization and protection necessary for data base management and real time communications.

Key Specifications:

Cycle Time – 1.33 microseconds/two characters.

Memory Capacity – Up to 262,144 6-bit characters.

I/O Channels – 12, variable speed.

I/O Transfer Rate – 1,000,000 characters per second.

Peripherals – All Series 200 types.

Rental Range – $13,000-$30,000 per month.

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No other company in the computer business can match our capability, whether you want to rent a small piece of a computer or install your own system and share it among your operations. You can spend as little as $100 per month for one terminal attached to one of our time-sharing computers or up to $100,000 per month for your own powerful time-sharing system with hundreds of terminals wherever you want them. With Honeywell you have the widest choice of services, the widest choice of systems, and the broadest range of experience in the industry.

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For more information about any of these new products, write Honeywell Information Systems, (MS261), 200 Smith Street, Waltham, Mass. 02154.

The Other Computer Company:

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Bell Supplies Toll Tapes

NEW YORK – Computer users can obtain their telephone billing information directly in magnetic tape format from most local telephone companies, according to a spokesman for AT&T.

Although the service has been offered for some time, "it is not limited strictly to large customers, and is available to any user who requests it," AT&T said.

The exact data format of an individual tape will depend on the computer being used by the local Bell company. Under the service, which is commonly known as "large user tapes," the customer receives a tape readout that is compatible with the computer at the local Bell company. A card version is also available. Any reformatting must be done by the user, however.

The tapes can be valuable to users who analyze their telephone usage patterns with a computer. Several software packages are currently available to help users optimize their phone traffic to reduce costs. The availability of the Bell billing tapes could eliminate the need for such users to convert data for input into their computer.

The service costs users between $50/mo and $75/mo with the price based on CPU time required to run the tape, and the cost of the tape reel. The service is not a tariffed item and each Bell company sets its own rates, according to AT&T

7702s Used for Data

Private Cable Links Canada, UK

By Don Leavitt
CW Staff Writer

TORONTO, Ontario – The first private telephone channel to carry computer data between England and Canada has been in operation for two months and functioning smoothly, according to Bell-Canada.

Installation of the line was a joint effort of Bell-Canada, the Overseas Telecommunications Corp. and the British Post office, which handles telephone and data service in England.

The line indirectly links an IBM 360/25 in England with a 1401-7074 combination here, through 7702 magnetic tape transmit/receive terminals at each end.

Canada Life Assurance Co. uses the link to update insurance policy master files and answer inquires from British policyholders, on a turnaround basis of about 12 hours.

Communications

The private cable had to be conditioned to the C-2 level, according to Bell-Canada, and it is handling data at 2,400 bit/sec transmission speed. This may be increased to 4,800 bit/sec later this year, the carrier said, if the transmission continues to be as good as it has been.

Although the 7702 units normally can handle medium- or high-density tapes, data is recorded on 7-channel magnetic tapes at a low 200 char/in. density for the transatlantic link.

Direct computer-to-computer communication, without the intervening conversion to and from magnetic tapes, is being considered by the company, but is not likely in the foreseeable future.

Shared use of the private cable is another possibility for the future, a spokesman suggested. The current monthly cost of the service is approximately $14,000, he added.

The project took about nine months from inception to completion of first data transmissions, the company said.

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Telephone Toll Calls Analyzed by Package

DENVILLE, N.J. – Users with heavy telephone toll traffic may be able to cut expenses through studying reports produced with the Telephone Cost Control System (TCCS) from Computer Consultants Corp. (CCC).

TCCS can be used by businesses operating under Bell's Centrex, toll code or similar billing procedures in which the origin of calls can be identified.

Calls placed through PBX or switchboard service cannot be traced to their sources and would not be suitable for the TCCS analysis, according to CCC.

As input, the system uses billing data that can be obtained directly from the local telephone company on "large user tapes" or cards.

From that data, TCCS produces three reports, The first shows complete details of all long distance calls made by each individual, including type of call, time of day, and called location.

The second report summarizes individual data on a department level, and includes a prorata breakdown of equipment charges and local call charges.

TCCS is written in Cobol and has been implemented on an IBM 360 operating under DOS. The package requires 18K bytes of storage, two tapes and one disk, or three disk units.

The system becomes more efficient with additional core, CCC said, and costs $5,000 from the firm at Route 46.

AT&T Files to Continue Dataphone 50 Service

WASHINGTON, D.C. – AT&T has notified the FCC that it will continue to offer its experimental 50 kbit data service for another year, until March 1972. AT&T explained that the extension would permit further trials of the Dataphone 50 offering.

The service presently is of limited application to users for two reasons. Equipment that can operate effectively at the 50 kbit/sec rate is not generally available; and few users handle enough data to require the fast transmission speed.

Currently there is only one interestate user of the Dataphone 50 service, according to an AT&T spokesman.

RFL Matches Bell Data Sets

BOONTON, N.J. – A data modem from RFL Industries, Inc. can transmit serial binary data over a voice bandwidth at a synchronous rate of 2,000 bit/sec.

The Model 4604 is compatible with all features and options of the Bell 201B and 201A data sets, the company said, and conforms to EIA RS232 specifications.

The price of the Model 4604 is $2,100.

Bits and Pieces

REI Cuts COM Prices 30% on Lease Units

DALLAS – Recognition Equipment has made a 30% cut in prices for leased COM equipment by changing its leases from a one-to-five year plan to a fixed one-year term.

The Output Image 400 is being offered at $2,015/mo. The 500 model is now $2,740/mo. The price of the Model 600 has been reduced to $3,715/mo, while the 700 model is being offered at $4,525/mo.

All of the prices include maintenance.

Although referred to as a one-year lease, the new plan could more properly be called a two-year lease because the customer must agree to pay a penalty equal to 10% of the purchase price of the equipment if he chooses to remove it after the first year. There is no such penalty after two years.

Low-Priced 1,600 bit/in. Drive Provides Drafting System Input

SOUTH WINDSOR, Conn. – The Gerber 9-track Model M-16 tape drive accepts data compatible with IBM 2400 tape units at 1,600 bit/in. and converts it for input to Gerber drafting systems.

Equipped with 10-1/2-in. reels, the M-16 consists of a medium-speed tape transport with read electronics; a core memory for temporary storage; and solid state logic for control, code translation and interface.

The M-16 costs under $30,000, and delivery is 90 days from 83 Gerber Road.

Speech Patterns Stored in Mini To Be Used for Identification

IRVINE, Calif. – A custom identification system of speech patterns, developed by Farrington Manufacturing Co., stores hundreds of voiceprints in a Varian 620/i minicomputer.

Based on such variations as vocal chords, throat, and tongue, the system works by matching known speech patterns against stored verbal patterns.

Among possible applications are the clearance of personnel entering secure areas, the identification of telephone customers, and control over those accessing data banks. Details are available from Varian at 2722 Michelson Drive.

Atlantic Repeater Can Correct Severe Data Signal Distortion

ALEXANDRIA, Va. – A device, which will correct serial data distorted as much as 45%, is available from Atlantic Research, a division of Susquehanna Corp. The unit retransmits a serial stream of timed data bits and can be used in any data transmission or computer system with serial data, Atlantic said.

The low-cost SSR-11 (Start-Stop Regenerative Repeater) allows a choice of any four signal speeds from 30 to 150 bit/sec. Options are available for up to 2,400 bit/sec.

The SSR-11 is priced at $170 and is available in 30-days from Shirley Highway at Edsall Road.

IBM Cartridge Length Matched

SANTA CLARA, Calif. – In response to IBM, Memorex has made available MT/ST tapes in 120 ft cartridges.

The tapes, priced from $19.75 to $11.50 according to quantity, are guaranteed for one year from 1180 Shulman Ave.

24-Hour Use Planned

First 370 Replaces IBM 360/30 and 40

By Frank Piasta
CW Staff Writer

FRAMINGHAM, Mass. – The first installed IBM 370, a 512K Model 155 obtained on a third-party lease, went into service here without parallel runs after only three days of testing, replacing two 360s, a 30 and a 40.

The computer was accepted by the Zayre Corp., a chain of 200 retail stores, on Feb. 1. It is currently being used to process data on more than two-million customer sales recorded each week, on a 24-hour, seven-day schedule.

"We're delighted that we have had no problems in running our 360 programs on the 155," said R. M. Bozeman, a Zayre vice-president," We are pleased with the system's speed and economy." he added.

Doubles Model 50 Throughput

He estimated that the 370, currently running under DOS, is producing about double the throughput of the company's 256K, 360/50, which is still operating. An additional increase of about one-third could be expected when the system is cut over to OS by the middle of the year, he said. The original IBM 155 announcement had stated that an increase of up to four times the throughput of the 360/50 could be expected by users.

The Zayre changeover to OS from DOS will be done gradually. Beginning during the middle of Februrary, programs will slowly be changed from DOS to OS until the entire system is converted next June.

Called Too Fast

The only problem encountered thus far was the difficulty the operators have in keeping up with the faster 155 system, a Zayre spokesman said.

The installation also includes six System/3 Model 10s. The 360/50 will have its workload transferred to the 155 or be replaced by a 370/145 at about the middle of this year.

The System/3s will be used for direct data communications with the 155 by the middle of the year, Bozeman said. The smaller systems are located at several points throughout the country.

The 155 was obtained on a third-party lease from Bankers Leasing Co. The seven-year payout arrangement will save Zayre about 27% the first year and 18% the second year, according to a Zayre spokesman. Part of the savings were attributed to the around-the-clock nature of the installation's workload.

The 370/155 includes one-byte multiplexer and three block multiplexer channels. A 2314 disk system and six 2401 mag tape units are on-line. Two 1403 printers and 16 2401 tape units are shared with the 360/50.

The configuration also includes a 2540 card read punch, a 2501 card reader and a 2761 paper tape reader.

Adapter Allows 029 Keypunch To Be Used as Data Terminal

FORT LAUDERDALE, Fla. – Users of IBM 029 keypunches can utilize the acoustically coupled Telepunch adapter from Western Union Computer Utilities (Wucu) to transmit and receive card data over the dial-up phone network.

The device allows users to transmit punched card data to any site which has a keypunch equipped with another Telepunch.

Designed to speed input of data between branch data centers and their home office, the Telepunch can be attached to a keypunch in five minutes and does not interfere with the normal operation of the 029. IBM service and lease contracts are not affected, Wucu said.

Each column of data is read by the sending unit, and transmitted. The receving unit punches characters at 18 col/sec.

IBM offers a somewhat similar unit, the 545 Output Punch. Although lower in price than the 029 with a Telepunch, the IBM unit is limited to receive-only operation. It can also operate as a normal 029 when not being used to receive card data.

The Telepunch costs $68.75/mo, or $1,675. Service is provided by Western Union Telegraph Co. Delivery from 609 S. Andrews Ave. is on a 60-day schedule.

Wucu Telepunch

Burroughs Banking System, Two Terminals Introduced

DETROIT – The newest members of the Burroughs TU terminal family, the TU 500 Commercial Teller Terminal and the TU 910 Terminal Unit Controller, for banking use, can operate on-line or off-line.

Burroughs also announced two on-line terminal computers that add forms handling and data communications to its TC family.

The financial system consists of a TU 910 and up to 15 TU terminals. It is designed to perform standard bank teller window transactions. It can be attached to any Burroughs B300, B500 or B700 computer

The purchase price of the TU 500 terminals ranges from $1,750 to $1,990; with lease prices from $42 to $48/mo.

The TU 910 controller is priced from $4,100 to $6,670, with lease prices from $102 to $168/mo. First deliveries are scheduled for January 1972.

The TC 1500 Series handles 15-1/2-in. forms handler with 150 print positions while the TC 2500 handles 26-inch forms with 255 print positions.

Both models have a standard transmission speed of 1,200 bit/sec with optional speeds of 600 and 1,800 bit/sec.

Purchase prices of the three TC 1500s range from $12,850 to $15,940; lease prices from $320 to $400/mo. Purchase prices of the three TC 2500s range from $13,850 to $16,940 while lease prices range from $345 to $425 per month.

TC 1500 models are now available, TC 2500 systems will be available in the second quarter of 1971.

Computer Pack Smells DP Room Smoke

DENVER – A remote control smoke detection system, Computer Pack, from Fire Alert Co., is designed to protect data processing installations.

The device is used with the company's FT-200 series of ionization detectors that require neither excessive heat nor smoke to detect fire. Price is said to be competitive. The firm is at 505 W. 40th Ave.

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CI Notes

370 Family to Get Bigger?

ARMONK, N.Y. – IBM may upstage another competitor this week if it announces the 370/135 close on the heels of Honeywell's introduction of the 6000 series, as IBM salesmen are rumoring.

The industry giant upstaged NCR late last year with the introduction of the 370/145 the same week that NCR rolled out its Century 300 machine – and IBM got most of the headlines and interest.

It appears likely that the new member in the IBM 370 series will also put "the seal of approval" on the RCA virtual memory concept. Industry sources say that the 135 will employ the concept.

Consolidated Computer, Ford Form Lease Financing Unit

TORONTO, Canada – Consolidated Computer Ltd. and Ford Motor Credit Co. have established a new lease financing company, Consolidated Computer Leasing Corp., to finance the leasing of up to $15 million of Key-Edit equipment to users in North America.

The new leasing program will be initially owned 80% by Ford Motor Credit Co. and 20% by Consolidated Computer International Inc., the U.S. subsidiary of Consolidated.

Tax Credit – New Style

It has finally happened. Now that annual debt to our mutual Uncle can be satisfied by credit card. According to American Computer Tax Service, a nationwide chain of tax consultants which encourages the preparation of tax returns by computer, taxes can be paid by Bankamericard, when American Computer Tax Service prepares the forms.

Supershorts

Datawest Corp. has announced the Model 531107 IBM System 360 Simulator. The system was developed to enable manufacturers of 360-compatible equipment to decrease the cost of testing.

– – –

Digital Information Devices Inc. and MAI Peripheral Corp. have jointly signed a new marketing agreement modifying a preexisting 1968 contract and covering the six-month period through July 31, 1971. Under the terms of the new agreement, MAI will purchase approximately $1 million of DID equipment at a specified monthly rate of delivery for six months.

– – –

Tennecomp Systems Inc., has announced an agreement whereby Digital Equipment Corp. will provide maintenance service nationally on three models of Tennecomp peripherals – the TP-1351 Magnetic Tape Unit, TP-1346 Automatic Loader and TP-1369 Push-Button Program Loader.

– – –

Peripheral Equipment Corp. has received a $750,000 contract from Consolidated Computer for 250 PEC 6000 Series tape transports for CCL's Key-Edit data preparation system.

– – –

Mitsui & Co. Ltd. has announced an agreement with Seaco Computer-Display Inc. in which the Japanese general trading firm has been appointed sales and service representative in Japan and the Far East for Seaco peripheral electronic computer equipment.

Commerce Sponsors Exhibition

Terminal Makers Find Italy Attractive

WASHINGTON, D.C. – U.S. manufacturers of terminals and other peripheral equipment got a big boost on the growing Italian computer market through a Commerce Department-sponsored exhibition at the recent Biennial International Instrumentation and Automation Show (Bias) in Milan.

The 28 U.S. exhibitors reported $1.3 million in floor sales and estimated that additional sales would total $7.4 million in a year's time as a direct result of the exhibit.

Of eight U.S. firms seeking agents to handle their products on a long-term basis, four signed agreements during the show – three for Italy; one for South Africa. Negotiations were under way for additional agents in Austria, Switzerland and Yugoslavia.

Market Defined

The Commerce Global Marketing Program survey for Italy projects total Italian EDP imports in 1974 at $73 million, with the U.S. share at $22 million. The survey also indicates that best-selling EDP products in Italy over the next few years are expected to be large, medium and small digital computers; terminals (information display, keyboard, teleprinter); data transmission equipment; disk memories; plotters; high-speed printers; magnetic tape transports; key-to-magnetic tape equipment; and paper tape-to-magnetic tape converters.

The trend in Italy is toward larger computers installed at service centers that serve a number of terminals. A shortage of data processing personnel is giving impetus to the rise in terminal-connected service centers, the department said.

The tremendous jump in the number of data transmission terminals in use in Italy – from 400 at the end of 1968 to upwards of 2,000 by the end of 1970 – underlines the market potential for terminals, including information display, keyboard and teleprinter equipment, and for modems (1,000 in use as of February 1970), acoustic couplers, line controllers and related data transmission equipment.

The Reconstruction Institute, a holding company for a number of government-controlled corporations, will be a major influence in further developing the use of EDP in Italy, according to the Commerce survey.

It includes over 130 companies with some 295,000 employees. At the beginning of 1970, firms in IRI had a total of 128 computers; about $50 million a year was being spent on EDP personnel, hardware and software.

At Bias, California Computer Products Inc., Anaheim, Calif., showing a controller, magnetic tape unit and digital incremental drum plotter, wrote $50,000 worth of floor orders and forecast an additional $100,000 in new export business in Italy in a year.

Computer-Link International, Burlington, Mass., new to the Italian market, exhibiting a portable terminal, telephone coupler, portable control plotter magnetic tape evaluator and a cleaner and rewinder, made sales of $2,200 and projected $25,000 in export sales in a year.

Data Disc Inc., Palo Alto, Calif., also new to the Italian market, displaying an instrumentation disk recorder, video disk file system, graphis display system and disk memory unit, reported $10,000 in on-the-spot business and predicted another $100,000 in exports to Italy within a year.

Shakeout of Minis Expected To Accompany DP Growth

SAN DIEGO – The computer industry will double in size every three years in the foreseeable future, but the number of companies in it will be reduced by half, a computer company president has predicted.

The forecast came from James B. Hunter, president of Digital Scientific Corp.

"Our projections," Hunter said, "indicate that our industry will grow at a rate of at least 30% per year, or slightly more, for at least the next several years. Thus it will be twice today's size in just about three years, and we expect it to continue at that rate."

But he also predicted a drastic shakeout, especially among manufacturers of minicomputers. "Today there are around 100 companies making small computers. We expect there will be room for 20, or 30 at the most," declared Hunter.

"Based on our record to date, we expect to grow faster than the industry's 30% a year rate," Hunter said. He noted that his company, which is just over three years old, has jumped from an annual sales rate of $4 million last year to an anticipated $10 million in 1971, "and we see no reason today why we can't continue or even increase this rate of growth."

MAJOR TRADE SHOW

SOUTHERN COMPUTER CONFERENCE

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APRIL 21-22-23, 1971

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This offer is being limited to 45 advertisers on a first come, first served basis.

COMPUTERWORLD

Core Memory for Military Use Has 400 nsec Data Access Time

CULVER CITY, Calif. – A core memory ruggedized for military use and offering data access time of 400 nsec is being marketed by Ampex Corp.

The Model RGM memory is available in capacities of 4,096 words by 18 and by 36 bits, 8,192 words by 18 bits and 16,384 words by 18 bits. The unit has a full cycle time of 1 μsec and operates in modes of read-restore, clear-write and read-modify write. It is available 60 days after order.

The memory operates in temperatures from -20° C to +55° C and relative humidity up to 95% at altitudes up to 10,000 ft. Non-operating limits are -54° C to +85° C, humidity up to 100% and altitude up to 50,000 ft.

Computer Microtechnology Goes Bipolar With Generator

SUNNYVALE, Calif. – Computer Microtechnology is shipping a TTL 1120-bit character generator, the CM 2900, which is organized 224 words by 5 bits. Designed to fit 5 by 7 dot matrix display sockets and furnish direct drive for LED displays, the 2900 has a standard font for Ascii code.

Access time is 50 nsec typical. Typical power needed is 450 mW. Chip selects allow pairing two CM 2900s to provide a 7 by 10 dot pattern. Prices are $102 (1-9); $81 (10-24) and $62 (25-100) from the firm at 611 Vaqueros.

New OEM Products

RFL Has 103 Type Modem

BOONTON, N.J. – RFL Industries Inc. has introduced an originate only, 103 type modem for OEM applications. The Model 5105 is compatible with Bell 103A2, 103E, and 103F Models. The 5105 is capable of operating full-duplex at 300 bit/sec, is strappable for half-duplex and will interface to Bell couplers.

Bandpass filters provide minimum 60 dB adjacent channel rejection, greater noise immunity and the unit will operate over a temperature range of -20° C to +60° C. Digital interface for EIA, CCITT, TTL, DTL, and teletypewriter is provided and control functions including Signal Common, Transmitted Data, Received Data, and Request to Send is standard; Data Carrier Detect is optional.

Prices start at $95.

Datapac Makes U-Core ROM

SANTA ANA, Calif. – Braided U-Core ROMs are available from Datapac, Inc. They range in speeds from 200 to 250 nsec cycle times and 100 to 120 nsec access times.

Within certain constraints, such as board size and bits per word relationships, the high-speed option can be ordered on all existing Datapac ROMs. No increase in physical size or shape is required.

Bit capacities from 5,000 to 20,000 are available with bit/word sizes up to 48 bits. Prices range from $525 to $2,500 depending on bit capacity and quantity, according to the company at 3839 S. Main St.

3 Connectors Announced

WARREN, Pa. – The availability of three new commercial connectors for the computer industry has been announced by the Parts Division of GTE Sylvania. The connectors are part of the P201 series and include a dual-position/36 contact; a dual-position/72 contact, and a dual-position/100 contact.

Additional configurations in 16 through 50 positions will be available if warranted by demand. All three connectors have phosphor bronze spring contact with coined 18-karat gold/silver dots. The positioning of the tip of each contact tail is held to within a .020-in. diameter of its locus or true position. The entire line is designed to accommodate automatic wire wrapping machines.

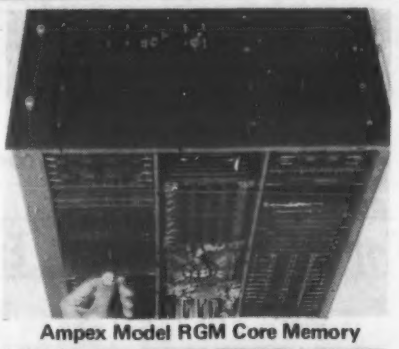
GTE Sylvania Inc. is at 12 Second Ave.

Mite Offers Mini Printer

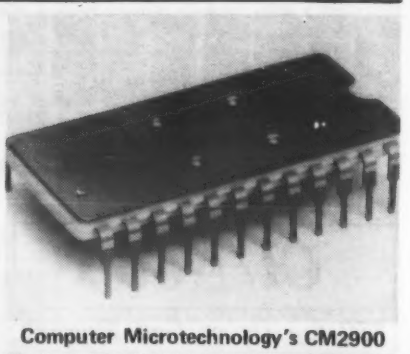
NEW HAVEN, Conn. – A small, portable printer from the Data Equipment Division of Mite Corp., the Model 118-A, is available with certain 16, 32, or 64 character alphabet; standard Baudot, standard weather, Ascii dense subset, touchtone or special characters of symbols.

The Model 118-A measures 4-13/16 in. wide, 10-11/16 in. long and 1-7/8 in. high. It weighs 3 lbs., 12 oz. and is available for either 26 ± 3 or 47 ± 4 Vdc operation.

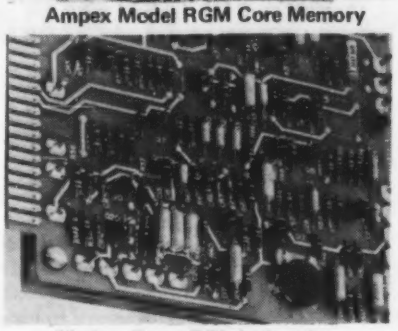
The 118-A operates at variable speed up to 10 char/sec with 9.3 char/in. or approximately 22,000 characters on a 3 in. roll of tape. Information is available from the division at 446 Blake St.



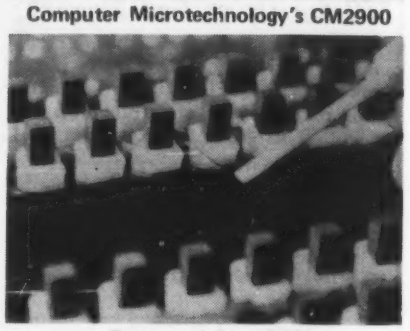
Ampex Model RGM Core Memory



Computer Microtechnology's CM2900



Modem From RFL Industries



Datapac U-Core ROM

There are 149 reasons to pre-register for the SJCC 71

10 reasons represent dollar savings

Beginning with the 1971 SJCC, you can save $10.00 on the conference registration fee. The "bonus saving" is offered to both "member" and "non-member" registrants providing their registration is received by APRIL 30th.

3 are the days of the conference

These three days—from May 18 to 20—will be packed with activity, all of which will center around the Conference Theme—Responsibility. Every effort has been made to ensure that your visit to Atlantic City will be professionally and personally rewarding. **(If you're counting, that's 13)**

2 for the doubled convention hall

This year represents the first conference in the newly expanded Convention Hall. In addition to increased exhibit facilities, the new accommodations permit all conference activities to be conducted on the same floor with additional meeting rooms for the Technical Program. **(That's 15)**

37 deal with the technical program

In addition to the Keynote Address by Sir John Wall (Chairman of the Board of International Computers, Limited), the Technical Program will consist of 36 sessions. Representative sessions include: *Image of the Industry*, an exploration of public attitudes by a panel of journalists; *Responsive Government*, relating the role of computers in Local, State, and Federal Government; *Competitive Evaluation of Interactive Systems*, Ford's evaluation of eight vendor supplied systems; and *Computers in the Electorial Process*. **(Now we're up to 52)**

9 are planned special activities

One highlight of the Special Activities for the SJCC will be an evening Ecology Forum—*Computation, Decision Making and the Environment*. Other activities range from the Computer Art Show and Forum, the Conference Reception and Luncheon, to a planned Post Conference Night on the Town in New York. **(That's 61)**

24 are the other guys waiting in each line to register

By pre-registering you will by-pass long registration lines at the conference and be able to pick up your credentials at specially provided desks. **(We're at 85)**

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8 ☐ Programming Application
9 ☐ Full Time Student

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3☐SCI 9☐ISA
4☐ACL 10☐SIAM
5☐AIAA 11☐SID
6☐AICPA 12☐SLA

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☐ Luncheon: $ 7.00

TOTAL:

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(Please enclose check payable to 71 SJCC)

Eximbank Services--Part 1

Programs More Important as Computer Need Grows

By J. Patrick Dugan
Special to Computerworld

Increasing competition in world trade requires exporters everywhere to improve their efficiency, which means that sooner or later most of them are customers for computers.

The U.S. Department of Commerce, in a recently published global survey, said that virtually every sizeable industry and government in the world is a potential buyer of EDP equipment and is thus "a target for U.S. exports," since American innovation completely dominates the field.

As to the extent of this domination, the Department found that 80% of the 34,000 computers installed or on order in 25 countries surveyed are products of American-owned firms (including overseas affiliates), and much of the remaining 20% was produced under U.S. licenses.

Financing

The computer industry so far has not found financing much of a problem. Nearly all sales have been in industrially developed countries where purchasers find it relatively easy to obtain credit through private lending sources.

The Export-Import Bank (Eximbank) of the U.S., which helps finance U.S. exports when adequate private funds are not available, supported only $11.5 million in overseas sales of U.S. computers, peripheral devices and software in fiscal 1970, whereas total U.S. computer exports are running close to $1 billion a year and are rising rapidly.

In recent months, however, the computer business has picked up substantially as word has spread of the services available at Eximbank since it was reorganized in 1969 to help relieve the balance of payments problem through export expansion.

This business is expected to keep growing as the demand for computers becomes more universal, with the world's smaller and medium-sized businesses joining in. Every businessman involved with this industry's exports should be acquainted with the several Eximbank programs which could prove especially useful to him.

Export Credit Insurance allows the U.S. supplier to protect himself against both political and commercial types of nonpayment risk. Political risks include war, expropriation and convertibility problems. Commercial risks are those involving default by the purchaser.

The insurance is available through the Foreign Credit Insurance Association (FCIA), a group of private insurance companies which collaborates with Eximbank. An advantage of the insurance, in addition to protection, is that it makes export paper more attractive to commercial banks in case the exporter wants to sell it for cash at any time.

Guarantees of leases are a form of service that seems almost tailor-made for the computer industry. Eximbank will extend either to a U.S. or a non-U.S. lessor (who can be a subsidiary of a U.S. firm) a guarantee of payment for the lease of equipment ouside the U.S. A requirement is that an export of U.S. equipment must be involved in the lease transaction.

The guarantee covers both political- and commercial-type risks, the fee being one-half of 1% of the value of the guarantee, payable annually in advance. New equipment may be covered, up to 100% of its value, at the beginning of the lease, and used equipment up to 85%, less, in both cases, any payments already received by the lessor.

A non-U.S. leasing company must pay the full sales price of the equipment in cash to the U.S. supplier before receiving a lease guarantee.

J. Patrick Dugan is senior vice-president and treasurer-controller of the Export-Import Bank of the U.S. Part II of this series will describe other Eximbank programs.

The last 64 reasons are the Atlantic City Hotels, who handle reservations on a first come basis.

Select your choice from the list below and mail your request early to ensure the accommodation of your choice. **(And that makes 149)**

MAP NO.	TOTAL ROOMS		ROOMS WITH BATH Twin/ Single	Double	PARLOR SUITES 1 Bedroom	2 Bedrooms
		BOARDWALK HOTELS				
6	83	Abbey (5)	10–12	14–16		
10	1000	Chalfonte-Haddon Hall (1,2,3)	13–35	19–37		
31	400	Claridge (1,2)	13–31	16–34	64–130	94–165
38	425	Dunlop (1,2,3,4)	15–27	18–36	50–70	67–100
43	400	Holiday (1,2,3,4,5)	16–28	24–36	72	84–138
57	166	LaConcha (1,2,3,4,5)	14–24	14–26	35–52	66–78
37	410	Marlborough-Blenheim (1,2,3,4)	14–18	18–30	44–60	
1	93	St. Charles (1,2,3,4,5)	10–15	16–20		
40	325	Shelburne-Empress (1,2,3,4)	15–27	18–36	47–72	67–100
52	119	Sheraton-Dunwoody (1,2,3,4,5)	14–30	16–32	50–100	80–135
3	160	Sheraton-Seaside (1,2,3,4,5)	18–22	22–30	65	95
28	600	Traymore (1,2,3,4)	12–26	16–30	35–85	65–135
		OFF-BOARDWALK HOTELS				
16	75	Carolina Court (5)	10–15	14–18		
8	195	Carteret Manor (1,2,4,5)	16–26	18–27		
34	100	Eastbourne (4,5)	12–14	15–18		
29	168	Jefferson (1,2,5)	12–14	16–18		
21	100	Richfield-Broomfield (1,5)	10–16	14–20		
24	60	Sterling (5)	12	14		
		MOTELS				
22	54	Acapulco (4,5)	14	16–20		
54	102	Algiers (1,2,3,4,5)	14–18	16–22	50	
59	64	Aloha (4,5)	16–18	18–22		
47	73	Ascot (4,5)	14–18	16–20	32	
29	108	Biale (1,2,3,4,5)	10–18	14–24		
15	100	Berkshire (4,5)	14–20	20–32		
12	73	Bluestay (3,4,5)	16–25	18–28	55–65	
32	110	Best Western Crillon (3,5)	16–24	18–30	60–70	80–90
18	88	Burgundy (4,5)	14–16	16–24		
46	84	Californian (2,4,5)	14–18	18–22		
58	60	Caribe (4,5)	16–18	18–24		
17	26	Carolina Court (5)		16–22		
56	38	Castle Rue (4,5)	12	14–20		
14	36	Catalina (4,5)	16–20	20–28		
30	275	Colony (1,2,3,4,5)	14–24	16–28	45–65	75–90
7	90	Colton Manor (1,2,4,5)	22–30	24–32		
27	64	Continental (4,5)	10–18	14–24		100
9	34	Crown (5)	14–16	16–20		
39	96	Dunes (1,2,3,4,5)		18–36		
49	61	Diplomat (4,5)	14–16	16–22	42–46	
51	95	Dutch (4,5)	14–18	16–22		
33	37	Eastbourne (4,5)	16–18	20–22		
48	25	Edwards (5)		16–20		
20	45	Envoy (5)	18	20–22		
19	72	Fenix (1,4,5)	20	22	50	
44	115	Four Seasons (3,4,5)	16–20	18–28		
50	64	Galaxie (4,5)	12–16	14–18		
42	333	Howard Johnson's (1,2,3,4,5)	18–22	22–38	52–76	114
13	225	LaFayette (1,2,3,4,5)	12–22	14–30	40–85	90–120
64	38	Lincoln Roosevelt Beach (4,5)	18	22–24		
23	247	Lombardy (1,3,4,5)	12–24	15–33		
60	72	Malibu (4,5)	9–21	12–24		
56	27	Mardi Gras (4,5)	14	16–20	30	
36	68	Marlborough-Blenheim (1,2,3,4)	27–29	56		
45	120	Pageant (1,2,3,4,5)	14–24	16–28		
63	137	President (1,2,3,4,5)	14–24	18–36		
35	152	Quality Motel-Mt. Royal (1,3,4,5)	12–24	15–33		
11	250	Ramada (1,2,4,5)	14–28	16–38	85–125	150
2	44	St. Moritz (5)		18–20		
41	266	Shelburne-Empress (1,2,3,4,5)	15–27	18–36	47–72	67–100
53	241	Sheraton-Dunwoody & Sheraton-Dunwoody West (1,2,3,4,5)	16–32	18–34	100	135
4	140	Sheraton-Seaside (1,2,3,4,5)	20–24	22–30	65	95
26	78	Sorrento (4,5)	12–14	12–18		
5	150	Terrace (1,2,3,4,5)	20–24	22–30	65	
61	54	Tropicana (4,5)		18–22		

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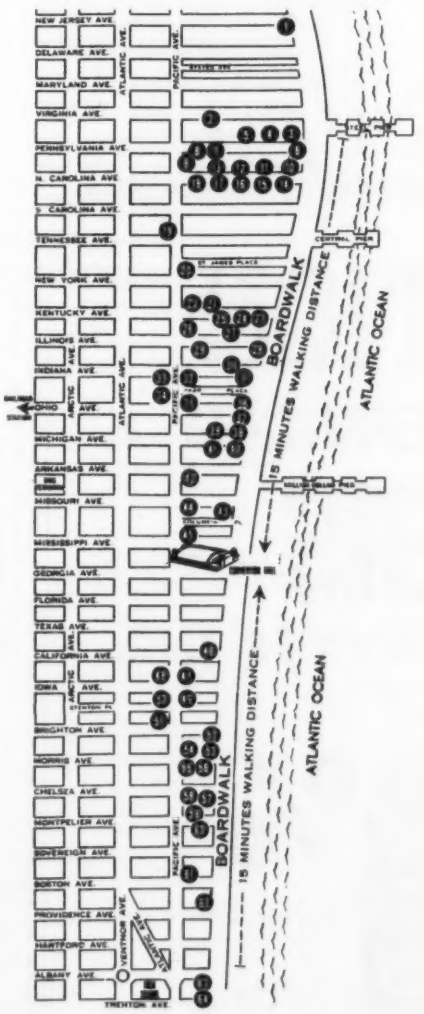

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at _____ a.m./p.m.

Confirm reservations to: (please print or type)
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Software Company Says Specialization Key to Its Success

WEST CHESTER, Pa. – The day of the general software practitioner is a thing of the past, according to Frederick A. Gross, the 31-year-old president of Systems & Computer Technology Corp. "He's going out of business."

Gross added that the two-year-old software services house is making money. "The economy has been kaput particularly for software/consulting companies. Our curve has been diametrically opposed to it. We have even been hiring people the past year." There are currently 26 people on board, with expansion to perhaps 35 by year-end.

The executive, who started the company in November 1968, believes there are two reasons for SCT's success: a different style of management philosophy and specialization.

As for specialization, SCT emphasizes products, "not packages," for higher education and state and local governments. One project the firm is presently involved in is with the Department of Housing and Urban Development. SCT is the technical project manager and cosystem/software contractor for a prototype computer-based municipal information system to be developed in Reading, Pa. Reading is one of six cities in the U.S. that is developing a prototype system.

Gross added that part of SCT's management philosophy relates to its "concentration" in specific market areas. Because of this concentration, he continued, "we have not been affected by cyclical changes in the economy. The areas we are in are national priorities: health, safety, law enforcement, education; our monies we contracted for were budgeted 18 months ago by our customers."

The executive believes that in two years the industry will see a number of computer services and software firms specializing by SIC (standard industrial classification) code.

"By specializing in certain markets, we can communicate in the language of our customers," Gross added.

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Top Three Executives Named at PSC

MIAMI – The three top executives of Proprietary Systems Corp. (PSC), commercial computer utility company, have been announced.

Robert S. McLeod has been named president and Ransom Meade, cofounder of the company, has been named vice-president in charge of technical operations. T. Kendall Hunt has been promoted from director of marketing to vice-president in charge of marketing.

Other Moves

■ Maxwell F. Eveleth Jr. has joined Robert E. Radican and Co. Inc., Providence, R.I., as vice-president responsible for corporate development and acquisition program. Eveleth was formerly vice-president, marketing, and vice-president corporate development, for International Data Corp. He also served as president of International Data Capital Corp., IDC's financial services subsidiary.

■ Computer Technology Inc. of Dallas has promoted Leo E. Hall to vice-president.

■ Robert W. Feesley has been elected president of Data Devices, Inc. of Tarzana, Calif.

Executive Corner

■ Remote Console Information Corp. of McLean, Va., has promoted James R. Saylor to vice-president, treasurer.

■ Donald L. Cravitz has been appointed vice-president of operations for Remote Computing Corp., Palo Alto, Calif.

■ Leo R. Hague has joined A.S. Hansen, Inc., Lake Bluff, Ill., as vice-president of computer resources.

■ Robert J. Spain has been named vice-president of research for Cambridge Memories, Inc., Newton, Mass.

■ Data Products Corp. of Los Angeles has appointed Frank McQuaid vice-president and general manager of its Telecommunications Division in Stamford, Conn.

■ Thomas A. Jenkins has been named vice-president of Electro-Print, Inc., Palo Alto, Calif.

■ Ezra D. Grodner has been elected secretary and a vice-president of Computer Sciences Corp., Los Angeles.

■ General Computer Services, Inc., Huntsville, Ala., has appointed Thomas W. Keown Jr. president.

■ Dynatech Corp., Santa Ana, Calif., has named Charles B. Mulholland vice-president and general manager.

■ George K. Bardos has been elected vice-president of Brokerage Transaction Services Inc., New York.

■ Tres Computer Systems, Inc. of Dallas has appointed Barnell Albers, Robert J. Branham and E.G. Prentice as vice-presidents.

■ William J. Vitek has joined Xerox Data Systems, El Segundo, Calif., as vice-president and manager of the Xerox subsidiary's Programming Division.

■ TLW Computer Industries of Atlanta, Ga., has appointed Frank A. Sylvester vice-president and regional sales manager with headquarters in Chicago.

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Nickels and Dimes

Electronic Engineering in Santa Ana is having its troubles, too. For the year ended Dec. 31, Eeco lost $664,000 on sales of $8.1 million. In 1969 sales were $9.6 million and income was $61,000. The loss contains a $296,000 extraordinary item, a reserve for the drop in market value of an investment. The operating loss was caused by government cutbacks, product development expenses, and "a precipitous decrease in shipments in the middle of the year." Sound familiar?

$$$

One of the stock market's honeys, **Milgo Electronic Corp.**, had a rough time during the first quarter. Sales dropped by about 50%, from $2.97 million to $1.98 million, and a $655,000 profit in the first quarter of fiscal 1970 turned into a net loss of $84,000. As well as a drop in modem sales, continued losses on government contracts and a change in lease accounting practices hurt the results. Board Chairman Monroe A. Miller, said, though, that "facilities and staff. . .presently are geared to a higher modem volume than was actually attained."

$$$

On a happy note, **Informatics** reported a net income of $232,000, or 15 cents a share, for the nine months. A year ago it lost $14,000. Revenues increased from $12 million to $13.4 million.

$$$

Management Assistance, long a financially troubled lessor of unit record equipment, has devised a scheme to recapitalize three issues of convertible debt. Pending approval of debt holders as well as share owners, MAI would register a new issue of 862,000 shares of preferred stock and 14.6 million shares of common. If the exchange offer goes through each $1,000 in debentures or notes would be exchanged for 20 share of preferred and 300 or 350 shares of common. MAI will also issue 195,000 shares of another new preferred to certain senior creditors in lieu of interest and principle.

Work for Nothing--Latest Industry Trend?

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – The latest industry trend – work for nothing.

The computer industry, at least in hard-hit California, is finding its people working without pay.

This new phenomenon is a result of the industry being hit simultaneously by cutbacks in its traditional main support, defense spending, by tight money, a shrinking economy, and by an over-reacting financial community.

Computer Operations, Inc., Costa Mesa, with designs for a fourth generation computer [CW, Dec. 2] has been working on the generosity of its employees since Nov. 1. About 32 people have contributed their time and many have contributed their money to keep the company going while it sought more financing and customers. Since they were so close to getting both, they held on.

On Jan. 29, the company threw in the towel. Plans now are to discuss merger with two major corporations who have shown interest in the Gemini computer. This will mean absorbing the company, the design work and the key personnel. The others are left out with their gamble.

Inventory Management Services Inc., Los Angeles, a bright hope in the grocery market terminal field, with computer hook-up for inventory updating, and price computations field, is in a somewhat similar position. Its product is already in the market. But checks bounced for most employees the first week of January.

Grocery store management and clerks are pleased with the IMS product, but overhead is steeper than profits at this point and IMS needs money.

From a staff of, at one time, more than 100, IMS is now down to about 30 volunteers.

Those working for nothing are given one share of stock for every $10 of salary they have missed when and if they get their financing. In addition, there will be a "rehire" bonus paid when the money is in the bank.

Financial

9-Month Loss of $804,000 Shown for Levin-Townsend

NEW YORK – Levin-Townsend Computer Corp. has reported a nine-month net loss of $804,000, accomplished by deducting net extraordinary charges of about $2.1 million from an operating profit of about $1.3 million.

Gross revenues for the nine months were $33.8 million.

The extraordinary items included a net loss of $769,000 from discontinued operations, a net loss of $2.2 million from real estate sales, a net gain of $489,000 from the repurchase of Levin-Townsend debentures, and an investment tax credit carryforward of $347,000.

Because of the extraordinary items, and $19.5 million in writeoffs last year, Levin-Townsend did not make any comparisons with last year's performance.

Throughout 1970 Levin-Townsend was plagued by cash flow problems and bad investments. At one point the third-party lessor was on the verge of having IBM reclaim its computers because of an alleged failure of L-T to make its payments.

The company was also the victim of a management squabble between founders Howard S. Levin and James E. Townsend.

Acquisitions

TBS Computer Centers Corp. has acquired **Computech, Inc.**, a subsidiary of International Systems Associates, Ltd. for an undisclosed amount of cash. Computech offers DP services in the New York area.

United Computing Systems, Inc. (UCS) has acquired the time-sharing services, and certain software packages and facilities provided by **Academy Computing**, Oklahoma City. UCS is a time-sharing and services organization based in Kansas City, Mo.

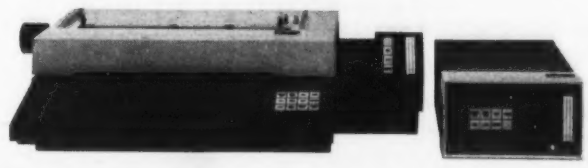
Tempo Computers, Inc., Fullerton, Calif., has been acquired by **General Telephone & Electronics Corp. (GT&E)**, Terms of the transaction were not disclosed. Tempo manufactures multi-purpose computers designed for data transmission applications.

A.T.Kearney & Co., Inc., management consultants, has acquired the business of **Caywood-Schiller, Assoc.**, operations research specialists.

Varadyne, Inc., Santa Monica, Calif., has reached a tentative agreement to acquire **Tel-Tech Corp.**, Rockville, Md., for an exchange of stock, Tel-Tech manufactures data communications equipment.

Los Angeles Life Insurance Co. has acquired **CIS Data Services, Inc.**, which will operate as a wholly owned subsidiary and provide DP services to the parent company as well as other clients.

Computing and Software (C&S) has acquired **Applied Information Development** (AID) of Oak Brook, Ill., for an undisclosed price. AID will become an operating unit in C&S's Information Processing Group, under the continuing direction of Lee Munder. AID is engaged in computer management consulting, systems design, and applications programming.



This terminal has two magnetic units. It performs all the off-line power typing functions better and for less money. And in addition, offers two-way communication capability with a computer. It's the new 5-51 System.

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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, FEBRUARY 11, 1971

EXCH		1970-71 RANGE (1)	CLOSE FEB 11 1971	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & DP SERVICES				
O	ADVANCED COMP TECH	1- 10	2 3/4	0	0.0
A	APPLIED DATA RES.	4- 24	8	+1 1/4	+18.5
O	APPLIED LOGIC	1- 18	1 1/2	0	0.0
O	ARIES	1- 8	1 7/8	+ 1/8	+7.1
N	AUTOMATIC DATA PROC	23- 49	48 1/4	+ 1/4	+0.5
O	AUTO SCIENCES	3- 14	5 7/8	0	0.0
O	BRANDON APPLIED SYS	1- 10	1	+ 1/8	+14.2
O	COMPUTER AGE INDUS.	1- 3	3/4	0	0.0
O	COMPUTER ENVIRON	1- 15	1 1/4	+ 1/4	+25.0
O	COMPUTER INDUS.	2- 24	5	0	0.0
O	COMPUTER NETWORK	2- 14	4 3/4	+1 3/8	+40.7
O	COMPUTER PROPERTY	4- 15	7 3/4	+ 1/2	+6.8
N	COMPUTER SCIENCES	6- 34	11 3/8	- 3/8	-3.1
O	COMPUTER TASK GROUP	1- 4	1	- 1/8	-11.1
O	COMPUTER USAGE	2- 8	6 1/2	- 1/2	-7.1
O	COMP AUTOMOT REPORTS	3- 11	6 1/2	+ 1/4	+4.0
A	COMPUTING & SOFTWARE	16- 75	34 1/4	- 1/4	-0.7
O	COMRESS	1- 10	1 3/4	- 1/8	-6.6
O	COMSHARE	2- 15	4 7/8	- 3/4	-13.3
O	CONSOL. ANAL. CENT.	1- 4	1 5/8	0	0.0
O	DATA AUTOMATION	1- 24	1 3/8	- 3/4	-35.2
O	DATA PACKAGING	5- 29	9 3/8	+ 5/8	+7.1
O	DATAMATION SERVICE	1- 6	1 3/4	0	0.0
O	DATATAB	4- 9	7 1/2	0	0.0
O	DIGITEK	1- 5	2 1/4	+ 1/2	+28.5
O	EDP RESOURCES	5- 13	8 3/4	+1 1/2	+20.6
A	ELECT COMP PROG	3- 11	5	- 3/8	-6.9
O	ELECTRONIC DATA SYS.	31-161	76 1/2	-1 1/2	-1.9
O	INFORMATICS	4- 21	9 3/4	+1	+11.4
A	ITEL	6- 26	18 3/4	+1	+5.6
A	MANAGEMENT DATA	7- 25	10 3/4	+ 3/4	+7.5
O	NATIONAL CSS INC	4- 16	8	- 1/2	-5.8
O	NAT COMP ANALYSTS	1- 8	1 5/8	- 1/8	-7.1
O	NAT.COMP. SERV.	2- 12	9	+6 1/4	+227.2
N	PLANNING RESEARCH	13- 54	22 7/8	+2 1/4	+10.9
O	PROGRAMMING METHODS	9- 27	24	+3 1/2	+17.0
O	PROGRAMMING & SYS	2- 5	3 1/2	+1	+40.0
L	PROGRAMMING SCIENCES	1- 33	2	- 1/2	-20.0
N	SCIENTIFIC RESOURCES	2- 22	4 3/8	0	0.0
O	SOFTWARE SYSTEMS	1- 3	5/8	+ 1/4	+66.6
O	TBS COMPUTER CENTERS	4- 27	6 1/4	+ 1/4	+4.1
O	TOLLEY INTL CORP	1- 13	4 7/8	- 1/8	-2.5
O	UNITED DATA CENTER	1- 5	4 3/4	+1 5/8	+52.0
N	UNIVERSITY COMPUTING	14- 99	27 5/8	+ 5/8	+2.3
A	URS SYSTEMS	5- 21	10 3/8	+ 1/2	+5.0
O	U.S. TIME SHARING	1- 14	2	+ 1/8	+6.6
	PERIPHERALS & SUBSYSTEMS				
N	ADDR ESSOGRAPH-MULT	20- 62	31 7/8	+1 1/4	+4.0
O	ALPHANUMERIC	2- 15	4 1/8	0	0.0
N	AMPEX CORP	13- 48	20 5/8	-1 1/8	-5.1
O	ASTRODATA	1- 34	1 1/4	0	0.0
O	ATLANTIC TECHNOLOGY	2- 14	5	+1 5/8	+48.1
A	BOLT,BERANEK & NEW	3- 11	7	- 3/4	-9.6
N	BUNKER-RAMO	6- 14	12 5/8	+ 1/8	+1.0
A	CALCOMP	11- 36	26 1/8	+1 5/8	+6.6
O	COGNITRONICS	3- 13	8 3/8	+ 1/8	+1.5
O	COLORADO INSTRUMENTS	4- 12	6 7/8	+ 5/8	+10.0
O	COMPUTER COMMUN.	5- 36	9 7/8	+1 3/8	+16.1
A	COMPUTER EQUIPMENT	4- 12	5 3/4	+ 1/2	+9.5
A	COMPUTEST	12- 28	18 1/2	+3	+19.3
O	CONSOL COMPUTER LTD.	4- 14	10 1/4	0	0.0
A	DATA PRODUCTS CORP	5- 26	8 3/8	+ 5/8	+8.0
O	DATA TECHNOLOGY	2- 23	7 3/8	+1 1/2	+25.5
O	DIGITRONICS	3- 13	6 1/4	+1 1/4	+25.0
N	ELECTRONIC M A M	7- 40	11 1/4	+ 3/4	+7.1
O	FABRI-TEK	2- 8	3	- 1/4	-7.6
O	FARRINGTON MFG	1- 17	1 5/8	- 7/8	-35.0
O	FOTO-MEM INC	2- 39	3 3/4	-2	-34.7
O	INFOREX INC	16- 39	34	+ 1/2	+1.4
O	INFORMATION DISPLAYS	4- 20	6 5/8	- 1/2	-7.0
O	KEYDATA CORP	7- 14	12 7/8	- 1/4	-1.9
O	MANAGEMENT ASSIST	1- 4	1 1/4	- 1/8	-9.0
A	MARSHALL INDUSTRIES	14- 67	22 1/2	+1 3/4	+8.4
A	MILGO ELECTRONICS	15- 42	21 3/8	+ 3/4	+3.6
N	MOHAWK DATA SCI	19- 87	29 3/4	-1 1/8	-3.6
O	ON LINE SYSTEMS INC	6- 23	11	-1	-8.3
O	OPTICAL SCANNING	11- 52	16	- 1/4	-1.5
O	PHOTON	4- 17	9 3/8	+1	+11.9
O	PHOTO-MAGNETIC SYS.	1- 6	7/8	+ 1/8	+16.6
A	POTTER INSTRUMENT	15- 42	20 3/4	- 7/8	-4.0
O	PRECISION INST.	6- 25	12 1/2	+ 3/4	+6.3
O	RECOGNITION EQUIP	12- 83	18	+ 5/8	+3.5
O	REDCOR CORP.	4- 34	7 1/4	+1 1/8	+18.3
N	SANDERS ASSOCIATES	7- 29	17 1/2	- 3/4	-4.1
O	SCAN DATA	5- 53	8 3/4	-1 3/8	-13.5
O	TALLY CORP.	10- 23	14 1/8	- 5/8	-4.2
N	TELEX	10- 25	17	- 1/2	-2.8
O	VIATRON	1- 51	2 1/4	- 7/8	-28.0
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 19	18 5/8	+2 5/8	+16.4
O	BALTIMORE BUS FORMS	6- 21	9 1/8	+ 1/2	+5.7
A	BARRY WRIGHT	6- 25	11 7/8	+1 5/8	+15.8
A	DATA DOCUMENTS	15- 35	24 5/8	+1 1/8	+4.7
N	ENNIS BUS. FORMS	9- 19	12 7/8	+ 1/8	+0.9
O	GRAHAM MAGNETICS	4- 15	15 1/4	0	0.0
O	GRAPHIC CONTROLS	5- 17	8 1/2	- 1/4	-2.8
N	MEMOREX	46-166	58 1/8	- 1/8	-0.2
N	3M COMPANY	71-114	102 1/2	+1 1/2	+1.4
O	MOORE BUS. FORMS	25- 39	38 3/4	+ 3/8	+0.9
N	NASHUA CORP	21- 43	35	+1 3/4	+5.1
O	REYNOLDS & REYNOLD	25- 48	41 1/4	+ 3/4	+1.8
O	STANDARD REGISTER	17- 30	21	- 1/2	-2.3
O	TAB PRODUCTS CO	4- 12	11 1/2	+ 7/8	+8.2
N	UARCO	22- 39	28 1/8	+ 1/2	+1.8
A	WABASH MAGNETICS	7- 30	8 3/4	0	0.0
I	WALLACE BUS FORMS	17- 41	21 1/4	+1 1/2	+7.5
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	78-173	125 1/4	+3 1/4	+2.6
N	COLLINS RADIO	9- 37	17 7/8	-1 1/8	-5.9
N	CONTROL DATA CORP	30-122	80 3/4	* 1/4	+0.4
O	DATA GENERAL CORP	16- 59	27 1/8	+1 5/8	+6.3
N	DIGITAL EQUIPMENT	50-124	67 3/4	+1 3/4	+2.6
N	ELECTRONIC ASSOC.	3- 11	7 1/8	* 1/4	+3.6
A	ELECTRONIC ENGINEER.	3- 14	7 3/4	0	0.0
I	FOXBORO	18- 39	32 7/8	- 1/8	-0.3
O	GENERAL AUTOMATION	9- 42	16 1/4	-1	-5.7
N	GENERAL ELECTRIC	60-106	104 1/2	+1	+0.9
N	HEWLETT-PACKARD CO	19- 45	36 1/4	+ 5/8	+1.7
N	HONEYWELL INC	65-152	97 1/2	+1 1/8	+1.1
N	IBM	223-387	338 3/4	+8 1/4	+2.4
O	INTERDATA INC	3- 22	8	- 1/4	-3.0
N	NCR	30- 86	41	+ 3/8	+0.9
N	RCA	18- 34	32 7/8	+ 1/8	+0.3
N	RAYTHEON CO	16- 37	35 3/8	+ 1/4	+0.7
O	SCI. CONTROL CORP.	1- 8	1 7/8	+1 1/8	+150.0
N	SPERRY RAND	19- 40	32 1/4	+ 1/2	+1.5
A	SYSTEMS ENG. LABS	10- 49	15 1/8	-2 3/8	-13.5
N	VARIAN ASSOCIATES	9- 29	17	+1 1/4	+7.9
N	WANG LABS.	18- 51	34 7/8	- 7/8	-2.4
N	XEROX CORP	66-115	95 5/8	-2 3/4	-2.7
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	18 3/4	+ 5/8	+3.4
O	BRESNAHAN COMP.	2- 9	3 3/4	- 1/4	-6.2
O	COMPUTER EXCHANGE	2- 8	7	+ 3/4	+12.0
A	COMPUTER INVSTRS GRP	4- 12	9 1/2	+ 3/8	+4.1
N	DATA PROC. F & G	6- 32	14 1/8	- 3/8	-2.5
O	DATRONIC RENTAL	2- 8	4	+ 1/4	+6.6
A	DEARBORN COMPUTER	10- 29	28 1/2	+1	+3.6
O	DIEBOLD COMP. LEAS.	2- 8	6 3/4	- 1/8	-1.8
A	DPA, INC.	3- 10	5 3/4	+ 1/8	+2.2
A	GRANITE MGT	7- 22	12 3/8	+2 1/2	+25.3
A	GREYHOUND COMPUTER	5- 44	9	+ 1/4	+2.8
N	LEASCO DATA PROC.	7- 30	19	+1 3/4	+10.1
O	LECTRO MGT INC	1- 9	2 3/4	+ 3/4	+37.5
A	LEVIN-TOWNSEND CMP	3- 19	6	- 1/8	-2.0
O	LMC DATA, INC.	1- 4	1 1/8	+ 1/8	+12.5
O	NCC INDUSTRIES	3- 8	5	- 1/8	-2.4
O	SYSTEMS CAPITAL	1- 8	5	+ 5/8	+14.2
N	U.S. LEASING	3- 20	18 1/4	- 3/8	-2.0

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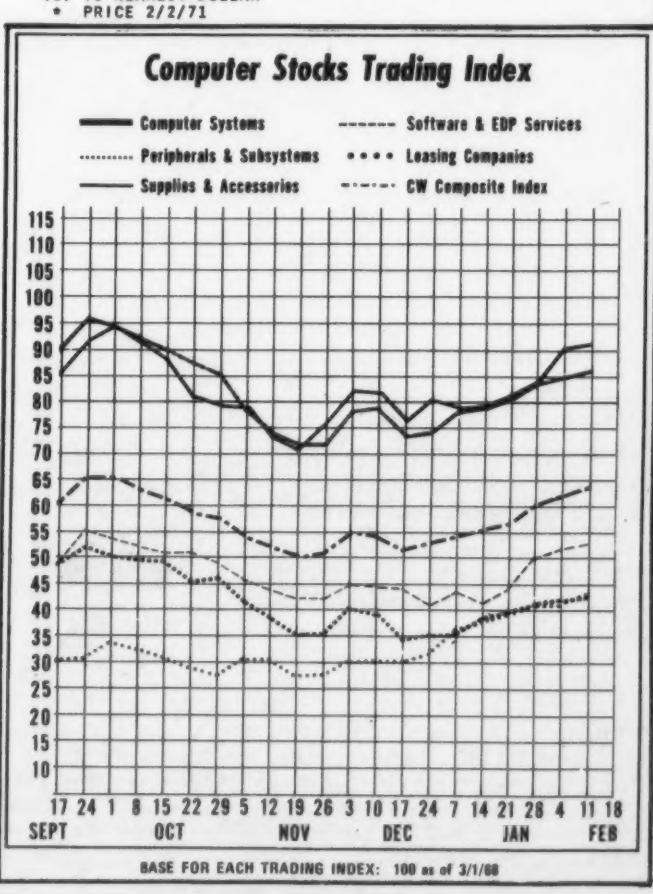
Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

INFORMATICS INC.
Nine Months Ended Dec. 26

	1970	1969
Shr Ernd	$.15	.....
Revenue	13,430,000	a$11,948,000
Spec Chg	.....	b1,479,000
Earnings (Loss)	232,000	(1,681,000)

a-Restated to exclude revenues from certain discontinued California data center operations of $409,000 in 1970 and $2.1 million in 1969. b-Represents write-off of goodwill of 1969 acquisitions.

REYNOLDS & REYNOLDS CO.
Three Months Ended Dec. 31

	1970	1969
Shr Ernd	$.37	$.35
Revenue	12,003,045	11,476,372
Earnings	841,122	800,975

URS SYSTEMS CORP.
Year Ended Oct. 31

	1970	1969
Shr Ernd	.....	a$.69
bRevenue	$20,564,575	25,133,912
cNet Cont Op	224,038	1,323,598
Disc Cont Op (Loss)	(368,291)	72,362
Spec Chg	d160,572	
Earnings (Loss)	(304,825)	1,395,960

a-Restated by company. b-From continuing operations. c-Equal to 10 cents a share in 1970 and 65 cents a share in 1969. d-For payment on a defaulted contract.

AMERICAN MICROSYSTEMS INC.
Year Ended Jan. 2

	1971	1970
Shr Ernd	a$1.26	.....
Revenue	28,500,000	$7,700,000
Spec Cred	b609,000	c151,000
eEarnings	3,095,000	126,000

a-Based on income before special credit. b-From tax-loss carryforward. c-From a licensing agreement partially offset by cost of unconsummated merger. e-Equal to $1.57 a share in 1971 and eight cents a share in 1970.

TECHNICAL OPERATIONS INC.
Three Months Ended Dec. 26

	1970	1969
Shr Ernd	.....	$.05
Revenue	$2,170,000	3,166,000
Earnings (Loss)	(320,000)	37,000

ITEL CORP.
Year Ended Dec. 31

	1970	1969
Shr Ernd	$1.00	$.86
Revenue	67,361,000	40,438,000
Earnings	4,263,000	3,289,000
3 Mo Shr	.34	.24
Revenue	20,474,000	11,912,000
Earnings	1,457,000	919,000

TAB PRODUCTS CO.
Six Months Ended Nov. 30

	1970	1969
Shr Ernd	$.42	$.28
Revenue	9,274,000	9,664,000
Earnings	352,000	233,000

SYNTONIC TECHNOLOGY
Six Months Ended Dec. 25

	1970	1969
Shr Ernd	$.26	$.29
Revenue	3,043,000	2,191,000
Earnings	122,300	131,000

TRACOR COMPUTING CORP.
Three Months Ended Dec. 31

	a1970	b1969
Revenue	$1,885,000	$2,430,000
Spec Chg	.....	c431,000
Earnings (Loss)	15,000	(980,000)

a-Unaudited. b-Restated to include operations of nine acquisitions on a pooling-of-interests basis. c-From discontinued operations of hardware products division.

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PDP 10	360/40
NCR 500	360/50
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